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To immunize or not to immunize, that is the question! An investigation into the reasons behind parents' decisions in immunizing their children against whooping cough in Western Australia

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TO IMMUNIZE OR NOT TO IMMUNIZE, THAT IS THE QUESTION! – AN INVESTIGATION INTO THE REASONS BEHIND PARENTS' DECISIONS IN IMMUNIZING THEIR CHILDREN AGAINST WHOOPING COUGH IN WESTERN AUSTRALIA

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I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma at any institution of higher education; and that to the best of my knowledge it does not contain any material previously published or written by another person except where due reference is made.

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15 November 1999

ABSTRACT

Demographic data on the immunization status of Australia indicates that Western Australia has relatively low immunization coverage for whooping cough. Australian quantitative studies have been carried out on parental attitudes in Australia towards immunization, but there has been no analysis of parents' reasons for their decisions. This study identified the key issues that influenced the decisions made by the target group of parents and explored their decision-making in more depth. The data from this study could also be used to supplement the information currently available to health workers.

Eight participants with children between the ages of 2 months and 6 years were recruited from Edith Cowan University, Mount Lawley Campus via posters. These parents were interviewed individually for approximately one hour, using a semi-structured interview technique. Their personal experiences with immunization were discussed. To facilitate the discussion and explore parents' understanding of the nature of disease, participants were shown a series of pictures and pamphlets relating to immunization.

For the group interviewed, the most important influences on their decisions to immunize their children were their family tradition, and the Federal government's incentive for new parents to encourage them to fully immunize their newborn children. Parents repeatedly discussed these two areas and stressed their importance. Once parents had been influenced towards their decision by one of these factors, the information given by medical authorities further reinforced their decision.

Initially, it was expected that other factors such as education, Health Department information and parents' personal models of immunity, would have played important roles in parents' decisions concerning immunization. However for the parents in this study, these factors had minimal effect on their decision-making processes.

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Chapter 1: INTRODUCTION

In 1995, only 71% of children between the ages of 0 and 6 were fully immunized against whooping cough. According to the government health department this rate is low, as they wish that 100% of children between those ages be fully immunized against whooping cough (Health Department of Western Australia, 1995). Rates below this cause concern to the Health Department, as they are associated with an increased risk of serious epidemics, which put stress on the hospital and public health systems (Health Department of Western Australia, 1995). During the 1994-95 financial year, in order to increase rates of immunization, the federal government implemented a number of strategies for monitoring up take rates and encouraging complete immunization for all children (Commonwealth Department of Human Services and Health, 1995).

The principal aims of this study were to identify the key issues that influenced parents' decisions in choosing whether to immunize their children against whooping cough, and to explore how parents come to their final decisions. Various quantitative studies have been conducted in order to document the groups in society most likely to contribute to decreased rates of immunization and incomplete immunization up take (Bazeley and Kemp, 1995; Wallis Consulting Group, 1995; Herceg *et al.*, 1995). The studies conducted by Bazeley and Kemp (1995) and the Wallis Consulting Group (1995) initially identified parental education level as a key factor in immunization rates. However, neither study considered the possible causal relationship between parental education and immunization rates.

Additional factors raise questions concerning the possible influences of the public understanding of the science behind vaccination, immunization education in schools, alternative health groups such as the Anti-Immunization lobby, and the understanding of immunization risks. An exploration of these factors and decision-making processes was incorporated into the design of this study. Qualitative analysis was considered to be the most appropriate research tool.

1.1 Research Questions

1. What are the key influences on parents' decisions in immunizing their children against whooping cough?

2. How do parents arrive at their own decision as to whether to immunize their children against whooping cough?

3. What is the role of past basic education, health department information, and personal biological models of immunity, in the decisions made by parents regarding their children's immunization?

1.2 Glossary

Archetypes: an inherited archive of archaic-mythic forms and figures that appear repeatedly in the most diverse cultures and historical epochs. They are considered to be primordial images preceding the ideas that articulate rational thought (Audi, 1995, p 393).

Epidemic: (especially of a disease) attacking or affecting many persons simultaneously in a community or area: a widespread occurrence of a disease; a rapid development, spread, or growth of something unpleasant (Hanks *et al.*, 1982, p 491)

Epidemiology: the study of disease, and disease attributes, in defined populations. It concerns the distribution and aetiology of disease. In the 19th century, it was mainly concerned with infectious diseases such as typhoid and cholera. Now the techniques of studying disease in defined populations are widely applied to the study of non-communicable disease. Epidemiology is the scientific basis for public health and especially preventative medicine (Critchley, 1978, p 601).

Ethnographic: the branch of anthropology that deals with the scientific description of individual human societies (Hanks *et al.*, 1982, p 502).

Immunization: the process by which the body develops the capacity, through defenses mediated by antibodies or lymphocytes, to combat an infection (Dircks, 1989, p 7-12).

Inoculation: a procedure used to introduce (the causative agent of a disease) into the body of (a person or animal), in order to induce immunity (Hanks *et al.*, 1982, p 754).

Morbidity: the state of being diseased or conductive to disease (Critchley, 1978, p 1105).

Mortality: condition or quality of liability to death (Critchley, 1978, p 1107).

Paradigm: the entire constellation of beliefs, values, techniques, and so on, shared by the members of a given community (Kuhn, 1962, p 175); a set of scientific and metaphysical beliefs that make up a theoretical framework within which scientific theories can be tested, evaluated, and if necessary, revised (Audi, 1995, p 557).

Toxoid: a toxin which has been rendered non-toxic by certain chemicals, or by heat, or by being partly neutralized by an anti-toxin (Macpherson, 1995, p 522).

Vaccination: the induction of the immune response by deliberate introduction into the body of materials derived from, or resembling, natural pathogens. The materials do not by themselves induce disease, but they induce immunization sufficiently to protect against later infection with the pathogen (Dircks, 1989, p 7-12).

Vaccine: a preparation containing disease-causing viruses or other micro-organisms (either killed or with attenuated virulence) that is introduced into humans or other animals to stimulate the formation of antibodies. In this way, immunity (partial or complete) to subsequent infection by that type of micro-organism is conferred (Uvarov and Isaacs, 1993, p 468).

Chapter 2: BACKGROUND TO THE STUDY

2.1 Immunization and Vaccination

Two hundred years ago, Edward Jenner published his *Inquiry into the Causes and Effects of the Variolae Vaccinae...known by the name of Cow Pox.* The title of his journal was derived from *Variolae vaccinae* (literally, smallpox of the cow; *vacca* - Latin for cow), the term invented by Edward Jenner to describe cowpox. In it, he established his theory that inoculated cowpox would prevent smallpox (Baxby, 1999). Jenner had previously observed that milkmaids, cattle and horse handlers seldom became infected with smallpox. He attributed this to their constant exposure to cowpox and thus, in his opinion, contact with cowpox provided long-life protection against smallpox (Baxby, 1999; Riedman, 1974).

Jenner's first vaccination of James Phipps, with pustules from the hand of Sarah Nelmes the milkmaid, was performed in May 1796. Phipps did not catch smallpox when coming in contact with infected people after about 6 weeks. This was the slightest evidence on which to base any claim, however he continued to carry out more vaccinations in 1798 (Baxby, 1999). Most of these vaccinations were successful, but not everybody was convinced that his methods were effective. It was not until 1881 that Pasteur suggested that the terms "vaccine" and "vaccination" should be broadened to include all such procedures in honour of Jenner (Baxby, 1999).

The term "immunization" denotes the process of inducing or providing immunity by the administration of an immunobiological product. The term "vaccination" on the other

hand, refers to the administration (usually by injection) of a vaccine or toxoid, whether or not the injection is successful in making the recipient immune (National Health and Medical Research Council, 1997). Nevertheless, the two terms are commonly used interchangeably in immunization literature, and this is interesting because it is a way of disguising the fact that vaccination does not always produce immunity. They have also been used interchangeably in this thesis.

2.1.1 Epidemics

Epidemics are extensive outbreaks of disease affecting a large number of people at the same time. They usually spread rapidly, and cases of disease occur suddenly in numbers clearly in excess of what is to be expected (Morris, 1992). Epidemic processes involve population interactions, and this is related to activities of individuals as well as individuals' immune system behaviours (Mollison, 1995). In order to assist the understanding of the "rates" involved in epidemics, models have been developed. The aim of such models is to describe and explain the dynamics of disease transmission in order to facilitate the subsequent control of disease (Mollison, 1995). By bringing vaccination rates into epidemic models, the impact or effectiveness of vaccination on the prevention of disease and epidemics can be explained. Epidemic models can either be descriptive or mathematical in their function, either describing epidemic processes, or generating epidemic statistics.

One model used for describing the spread of infectious disease is the "Epidemic Stages" model (Mollison, 1995, p 18). This model identifies three main epidemic stages -

Establishment, Spread, and *Persistence.* The stage of *Establishment* occurs when an infection arrives in a population and infects a sizeable proportion of the host population, rather than just a few individuals (Mollison, 1995). Once the disease has had initial success, its *Spread* then needs to be described through the population. This depends on whether the disease is restricted to a certain part of the population (seniors, children, etc); and on contact factors (local, nationwide, etc). In modern societies, population densities have increased, as well as contacts between individuals via air travel, which makes the spread of disease an important public health issue.

Finally, the conditions for long-term *Persistence* of an infection involve other factors such as population density and size, whether the infection persists continuously for a long time, or continuously throughout smaller intermittent outbreaks. In populations with a more constant density or static nature, as in the case of many animals and plants, a disease may persist through wandering patches without any one population being continuously infected. The population size required for persistence depends on the spatial structure and connectivity of the population as well as on the parameters of the infection itself. Geographical connectivity is also important for human diseases (Mollison, 1995). This model is useful in documenting and describing the spread of disease in populations.

Another useful model is that used by Morris (1995) in which the spread of infectious disease is explained via data driven network models. These models assume that infectious diseases are spread by person-to-person contact and that this is strongly channeled by patterns of selective social mixing. The more intimate and extended the contact needed for disease transmission, the more impact that selective mixing will have

on the speed and direction of spread (Morris, 1995). Mathematically, a "network" is a set of nodes connected by a set of links, and analysis involves finding the probability of a link between two nodes (Morris, 1995). In terms of infectious disease networks, the nodes are persons, and the links represent relations needed for disease transmission (e.g: proximity, touching, contiguousness) (Morris, 1995). Computer models can be run with these models to help predict the impact of vaccination on disease spread.

Epidemic models help public health bodies to predict the spread and rates of disease in populations. These models are concerned with population effectiveness of vaccines, not individual effectiveness. Indeed, individual effectiveness is simply introduced as a probability. Government health departments and medical officials are concerned about epidemics and disease epidemiology. Epidemics affect the economics and stability of the government public health system, by putting strain on public health systems (e.g: doctors, hospitals), and it is important that epidemics are avoided as far as possible.

2.1.2 Pertussis and Its Complications

Pertussis (whooping cough) is a highly contagious disease of the upper respiratory tract, caused by the bacterium *Bordetella pertussis* (Willems *et al.*, 1998). Infection occurs through respiratory droplets. Epidemics occur every 3-4 years. In unimmunized populations, these outbreaks can be very large, while in immunized populations, smaller outbreaks occur just as frequently but with greatly reduced mortality and morbidity (National Health and Medical Research Council, 1997).

During epidemics, most cases of whooping cough occur in school-aged children however, these children can in turn infect infant siblings, the group at highest risk of suffering from disease complications. Most school-aged children with pertussis have the characteristic paroxysmal cough with inspiratory whoop. The cough may persist for up to 3 months and is often associated with vomiting. The illness is serious enough to cause enormous family disruption and dysfunction (National Health and Medical Research Council, 1997).

Pertussis causes hypoxic encephalopathy (deficiency in the amount of oxygen delivered to the brain) which can lead to convulsions, coma, brain damage, and even death (Cowan *et al.*, 1993). The most common cause of death in pertussis infection is pertussis pneumonia (bronchopneumonia), sometimes complicated by seizures and encephalopathy (Cowan *et al.*, 1993). Other complications include subconjunctival haemorrhage, pulmonary complications such as atelectasis (collapse of the lung or part of the lung, caused by bronchial obstruction), convulsions, permanent sequelae (abnormal body condition arising from a pre-existing disease), paralysis, blindness, mental retardation, and epilepsy.

The reported death rates from pertussis are confusing and contradictory. In *The Australian Immunization Handbook* (1997) in the section on pertussis the National Health and Medical Research Council (NHMRC) states that "The overall mortality from pertussis is 0.3% but the mortality in babies under 6 months of age is 0.5%" (National Health and Medical Research Council, 1997, p 71), however, in the section on disease complications it is stated that there is a "1 in 200 chance [0.5%] of death in those less than 12 months of age who have been hospitalized" (National Health and Medical

Research Council, 1997, p 227). Neither report states the rates of hospitalization for various age groups. Unless these rates are close to 100%, then the data is inconsistent.

2.1.2.1 Pertussis Vaccines and Recommendations

There are two main types of pertussis vaccines which are commonly administered one of which is a whole cell pertussis vaccine (Triple Antigen) and an acellular pertussis vaccine (Infanrix). The triple antigen vaccine (diphtheria-tetanus-pertussis adsorbed) or DTP_w contains a whole cell pertussis vaccine. It contains fewer than 20 000 million *Bordetella pertussis* bacteria per 0.5ml adsorbed onto aluminium phosphate. Infanrix (diphtheria-tetanus-acellular pertussis adsorbed) or DTP_a contains an acellular pertussis vaccine. It contains less than 25 micrograms (µg) of pertussis toxoid (PT), 25µg filamentous haemagglutinin (FHA), 8µg pertactin (formerly called 69kDa protein), and fimbrial antigens or agglutinogens, adsorbed onto aluminium hydroxide as a preservative (National Health and Medical Research Council, 1997).

Whole cell and acellular pertussis vaccines differ in many ways (Table 2.1) The NHMRC makes no mention of which vaccine is better, and the disadvantages of the acellular pertussis vaccine are still unknown.

Table 2.1: The comparison of whole cell and acellular pertussis vaccines.

Factor	DTPw	DTPa
Efficacy (in children)	85-95%	85%
Advantages	Similar protection mechanism as that gained from natural pertussis infection	Fewer local reactions
Disadvantages	Protective efficacy wanes over time, may fall to 50% after 5 years, and to almost 0 after 12 years	Unknown
Side-Effects	Local Reactions	Hypotonic/hyporesponsive episodes[1]
Cost	Cheaper	More expensive
Manufacturer (in Australia)	CSL	SmithKline Beecham

[1] Muscles lacking normal tone or tension

(National Health and Medical Research Council, 1997; Hanks *et al.*, 1982; Decker *et al.*, 1995; Halsey and Georges, 1995).

According to the NHMRC, pertussis vaccines should be stored at 2-8°C, but never frozen, and the dose is 0.5ml given by intramuscular injection. It is recommended by the NHMRC (according to the Vaccination Schedule as of July 1998), that children should receive vaccinations against pertussis at 2 months, 4 months, 6 months, 18 months, and finally prior to school entry at 4-5 years (Figure 2.1). Each child should also be registered with the National Immunization Register (National Health and Medical Research Council, 1997).

Figure 2.1: The NHMRC Recommended Immunization Schedule (0-6 years) as of July 1998 (National Health and Medical Research Council, 1998, schedule supplement).

The NHMRC Recommended Immunisation Schedule (0-6 years)

AGE	DISEASE	VACCINE	MILESTONES
2 months	Diphtheria, tetanus and pertussis Poliomyelitis Hib	DTPw* or DTPa* OPV - Sabin vaccine Hib vaccine (HbOC or PRP-OMP)**	
4 months	Diphtheria, tetanus and pertussis Poliomyelitis Hib	DTPw* or DTPa* OPV - Sabin vaccine Hib vaccine (HbOC or PRP-OMP)**	
6 months	Diphtheria, tetanus and pertussis Poliomyelitis Hib (HbOC schedule only)	DTPw* or DTPa* OPV - Sabin vaccine Hib vaccine (HbOC)	First 6 months
12 months	Measles, mumps and rubella Hib (PRP-OMP schedule only)	MMR Hib vaccine (PRP-OMP)	Second 12 months
18 months	Diphtheria, tetanus and pertussis Hib (HbOC schedule only)	DTPa* or DTPw* Hib vaccine (HbOC)	Third 18 months
Prior to school entry (4-5 years)	Diphtheria, tetanus, pertussis Poliomyelitis Measles, mumps & rubella	DTPa* or DTPw* OPV - Sabin vaccine MMR	

* DTPw is the abbreviation for Diphtheria-Tetanus-whole cell Pertussis vaccine
DTPa is the abbreviation for Diphtheria-Tetanus-acellular Pertussis vaccine
DTPa and DTPw are now recommended for use in the primary course.

** Abbreviations for Hib vaccines - HbOC is 'HibTITER', PRP-OMP is 'PedvaxHIB', HbOC (HibTITER) is given at 2,4,6 and 18 months. PRP-OMP (PedvaxHIB) is given at 2, 4 and 12 months

2.1.2.2 Pertussis Vaccine Side-Effects

Vaccine side-effects are only documented for whole cell pertussis vaccines, as "the incidence of other side-effects with acellular vaccines has not been as extensively documented as it has with whole cell vaccines" (National Health and Medical Research Council, 1997, p 77). It should be noted that the literature does not state whether pertussis vaccine side-effects are age related, and/or whether there is a difference in the symptoms experienced by different ages of children. Also, the NHMRC does not provide quantitative data on the incidence of serious side-effects in Australia, and it is unclear whether mandatory recording exists. It is assumed that side-effects relate to Australian produced pertussis vaccines.

The whole cell pertussis vaccine can cause mild to moderate side-effects at both the site of injection and throughout the body, and it is the pertussis component of the DTP_w and the DTP_a vaccines that is responsible for most adverse reactions (National Health and Medical Research Council, 1997; Halsey and Georges, 1995). About 50% of infants will have swelling or redness at the injection site, 30% will become feverish, and over 30% will demonstrate persistent crying. Occasionally, vomiting and anorexia may occur, and rarely, encephalopathy (Willems *et al.*, 1998). However, the incidence of encephalopathy from pertussis infection is "hundreds of times higher" (National Health and Medical Research Council, 1997, p 72), than that associated with the pertussis vaccine, and most reactions are self-limited and last no longer than 24-48 hours (Cowan *et al.*, 1993).

The whole cell pertussis vaccine can also have serious, significant reactions such as "convulsions (1 in 1 750 doses); hypotonic/hyporesponsive episodes (1 in 300 to 1 in 30 000 doses); and high pitched, unusual screaming (1 in 10 to 1 in 1 000 doses)" (National Health and Medical Research Council, 1997, p 76), although according to the NHMRC, very few children experience serious reactions to the vaccine. It is stated that no long term side-effects have been seen after any of these reactions (Cowan *et al.*, 1993), and most reactions occur after DTP_w administration rather than CDT (combined diphtheria-tetanus) administration. Most vaccine side-effects can be relieved with paracetamol if administered up to 30 minutes before vaccination (15mg/kg per dose), and at 3-4 hour intervals afterwards if required, up to a maximum of six doses per 24 hours (National Health and Medical Research Council, 1997; Halsey and Georges, 1995). Although administering paracetamol to a child in order to help relieve vaccine side-effect symptoms is recommended, parents will not know in advance the extent to which their child will be affected by the vaccine, and hence whether they should administer paracetamol. Information on the source of recommendations for the use of paracetamol and on its mechanisms of action is lacking.

Even though the NHMRC points out "In children with a close family history (first degree relative) of idiopathic [unknown cause] epilepsy, there may be a risk of developing a similar condition, irrespective of vaccine" (National Health and Medical Research Council, 1997, p 76), they still recommend vaccination for these children. The NHMRC's advice is based on two British studies which have shown that children with family histories of epilepsy were vaccinated with pertussis and did not experience side-effects (National Health and Medical Research Council, 1997, however parents with

one child with idiopathic epilepsy are often concerned that vaccination might be a trigger for the epilepsy.

2.2 Vaccination Rates in Australia

It is difficult to obtain precise data on the death rates from pertussis in Australia. The NHMRC states that in Australia "Approximately 1 death occurs every 2 years" (National Health and Medical Research Council, 1997, p 227). This can be compared with world figures. The World Health Organization (WHO) state, in the *World Health Report for 1999*, that over 346 000 people die from pertussis world-wide each year (World Health Organization, 1999). Taking the current Australian population (18 520 000) (World Health Organization, 1998a), and the world population (6 000 000 000) (World Health Organization, 1998b), then Australia's share of people dying from pertussis would be close to 1 068 per year. The amount of 1 068 deaths is large when compared to 0.5 deaths per year. This rate of 1 death every 2 years might suggest that the pertussis vaccination programs have been successful in keeping death rates down, good public and personal health care has been effective in reducing the spread and hence death from the disease, and/or may suggest that the Australian population is healthy compared to world figures and this may be attributed to a good diet, good hygiene and other life-style factors.

In Western Australia in 1995, it was reported by the National Health Survey that in 1990, whooping cough had the lowest immunization up-take at 71.4% (Table 2.2), and full immunization against whooping cough was much lower for children in the

metropolitan area than in non-metropolitan areas (Health Department of Western Australia, 1995).

Table 2.2: The percentage of fully immunized children (aged 6 years and under) immunized against selected conditions, by area of residence in 1990, in Western Australia.

Condition	Metropolitan	Non-Metropolitan	State
Diphtheria[1]	85.9	85.1	85.7
Whooping Cough[1]	68.9	78.2	71.4
Poliomyelitis[1]	73.7	73.9	73.8
Measles[2]	89.0	84.3	87.7
Mumps[2]	82.7	76.5	81.1

Notes: [1] Ages 0 to 6 years
[2] Ages 1 to 6 years

(Health Department of Western Australia, 1995).

The percentage of children fully immunized against whooping cough is lower than for other diseases, and even lower for children in metropolitan areas. No indication of reasons or factors for this low rate were identified in this report. It is interesting to note however, that diphtheria and whooping cough are considered separately in terms of vaccinatable diseases. Diphtheria and pertussis form part of the triple antigen (DTP_w or DTP_a) vaccine, and it is unclear from the literature whether they were given separately and how the figures were derived.

In a 1993 report, by the Notifiable Infectious Diseases Register, females contracted pertussis at a higher rate than males, and non-aboriginal children contracted it at a higher rate than aboriginal children (Table 2.3).

Table 2.3: The rate of pertussis contraction in children between the ages of 0 and 4 years, according to sex and aboriginality.

Parameter	Rate (per 100 000)
Males	43.8
Females	48.1
Non-Aboriginal	44.6
Aboriginal	35.5

(Health Department of Western Australia, 1995).

Females are the group highest at risk of contracting pertussis, and aboriginals contract pertussis at the lowest rate. The report did not discuss possible factors affecting these rates.

Herceg *et al* (1995) assume that poor immunization coverage is the cause of these outbreaks, however accurate figures are not available on immunization coverage levels in Australia. The availability of figures for Western Australia is better than that for Australia, however it is still difficult to find Western Australian figures for each year consecutively from 1990 onwards. From the information available, pertussis immunization is not receiving as much attention from parents as that for other diseases. Improved immunization programs and strategies for improving immunization rates

through government policy may provide a means for increasing pertussis immunization rates (Lloyd, 1996; Ranganathan *et al.*, 1999).

2.2.1 Initiatives to Increase Rates of Immunization

The government has put in place a number of initiatives to increase immunization rates. The initiatives are based on public health assumptions and not on individual factors for decision-making. Individual factors are important both to the individual and society as they can affect up-take rates. The government has collected little or no data in this area, which is the niche this study will fill.

In November 1993, the Australian Health Minister's Advisory Committee (AHMAC) endorsed the recommendations of the NHMRC National Immunization Strategy. The strategy advocated the implementation of a number of initiatives to increase immunization coverage rates in Australia. The initiatives included:

(1) the removal of financial barriers (e.g: vaccine cost) to immunization

(2) the development of educational material and programs (for parents and immunization providers)

(3) legislation requiring parents to present a record of immunization status when enrolling children in child care facilities or schools

(4) improved surveillance of immunization coverage and,

(5) the development of recall/reminder schemes (Commonwealth Department of Human Services and Health, 1995).

These initiatives were implemented during the 1994-95 financial year. However, immunization rates for diseases such as pertussis and measles are still low. To address this problem, funds were provided for the establishment of the Australian Childhood Immunization Register. The register will be administered by the Commission on behalf of the National Childhood Immunization Committee (NCIC) as part of the National Immunization Strategy (Commonwealth Department of Human Services and Health, 1995).

It was expected that the Register would provide an effective management tool for monitoring immunization coverage and service delivery. The data collected would also form the basis of an optional recall/reminder scheme which would have the ability to inform parents when their child's next vaccination was due or overdue. If a parent or guardian of a child opts out of the recall/reminder scheme, identifying information would not be released (Commonwealth Department of Human Services and Health, 1995). The literature is unclear as to whom this "identifying information" will be released, or whether it will be used in the recall/reminder scheme. If the protocols used by the Australian Bureau of Statistics are followed, then the information will be aggregated to provide statistical and percentage data, and no names will be used in any case. There is no current information available as to how efficiently this scheme is operating, but it is assumed that it is now embedded in the standard vaccination procedures.

It is recommended by the NHMRC that parents provide evidence of the immunization status of their children when enrolling at child-care facilities, preschools, and schools, so that should an outbreak of disease occur, unimmunized children can be identified and

excluded from the facility for their own safety (Commonwealth Department of Human Services and Health, 1995). This measure is also thought to be beneficial in helping to limit the outbreak of a particular disease. It is also part of the regulations that information from the register will not be linked with other databases, and there will be no financial or other penalties for parents who choose not to immunize their children, although the link between the two is unclear (Commonwealth Department of Human Services and Health, 1995).

2.3 Formal Immunization Education in Western Australian Metropolitan High Schools

Immunization is not studied as part of the science or biology school curriculum, nor is it compulsory for teachers to teach it at any stage in the three basic years of high school education (F. Deshon, personal communication, March 23, 1999). Formal high school education is classified as Year 8 to Year 10. In these years, biology includes areas such as genetics, and field ecology (Anderton *et al.*, 1995). The most relevant section in the science curriculum for immunization is the area of genetics which involves the study of cells, chromosomes, genes, reproduction, inheritance, heredity, mutations, natural selection, and biotechnology. The field ecology section involves the study of environment, soil, organisms, and populations (Anderton *et al.*, 1995).

Immunization may be taught as part of the health education curriculum from Year 7 (primary school) through Year 10 under the societal health issues Strand (Education Department of Western Australia, n.d.). The main objectives to be gained by students

studying societal health issues, is an opportunity to discuss current health issues, with the background understanding that "health products and information should be selected, evaluated and used on the basis of accurate data and, at times and/or different cultures, various health issues become controversial" (Education Department of Western Australia, n.d., p 195). It is suggested that immunization be taught as a health issue, but it is not compulsory (Education Department of Western Australia, n.d.).

The curriculum also outlines the status of some diseases and immunization in general. It states that immunization "is a forever-current issue, in that there will always be the need for people to be immunized against some forms of disease. There is no room for complacency in this area for, although diseases such as diphtheria, poliomyelitis, and whooping cough (pertussis) may be much reduced by immunization, they are never totally eliminated" (Education Department of Western Australia, n.d., p 196).

Immunization is considered in the curriculum as "a simple, effective way of protecting people from some of the most dangerous infectious diseases in the community. Most immunizations are courses of vaccines that build up the body's ability to destroy particular disease germs before they can cause illness" (Education Department of Western Australia, n.d., p 196). The main diseases which are stressed in terms of standard immunizations given in Australia are diphtheria, tetanus, whooping cough, poliomyelitis, mumps, measles, and rubella (Education Department of Western Australia, n.d.). If there is any other information that both students or teachers may need concerning immunization, it is suggested that the Health Department of Western Australia, or the Health Promotions Unit be contacted (Education Department of Western Australia, n.d.).

The curriculum outlines some guidelines for teaching about immunization. These are:

- immunization should be discussed openly,
- as much as possible should be found out about immunization,
- students should decide whether media coverage of immunization is accurate, and
- students should explore how immunization affected death rates in Western Australia and around the world.

It mentions that it is an important issue and some basic epidemiology is provided. Exercises are also given to make students think about issues and decisions concerning immunization. This is very important and would be expected to influence students' decision-making processes, as well as clarifying students' own ideas about immunization, not only at the time of learning, but also in the future. This education is valuable in the long-run not only to the individual parent and child, but also to the community. Even if a parent chooses not to immunize their child, at least they have been informed about immunization methods and can make an educated decision about their child's health and safety.

2.3.1 Immunization Up-Take and Parental Education Status

Three studies investigating immunization up-take and parental education were conducted in Australia in 1995 (Herceg *et al.*, 1995; Bazeley and Kemp, 1995; Wallis Consulting Group, 1995). Herceg *et al* (1995) interviewed parents of two-year-old children to determine immunization coverage on a population basis. Bazeley and Kemp (1995) on the other hand, used telephone and personal interviews of new mothers to determine the rate of immunization clinic attendance, while the Wallis Consulting

Group (1995) conducted a population survey using Computer Assisted Telephone Interview (CATI) survey questionnaires to determine parental attitudes to the planned Australian Childhood Immunization Register. All studies determined the education level of principal carers born in Australia (Table 2.4).

Table 2.4: The highest education level of principal child care-givers born in Australia expressed as percentages, as determined by Herceg *et al* (1995); Bazeley and Kemp (1995), and the Wallis Consulting Group (1995).

Parameters	Herceg *et al*	Bazeley and Kemp	Wallis Consulting Group
Parents born in Australia	87	74.7	77
Year 10 Education	65	38.6	46
Year 12 Education	12	36.7	31
Post Secondary Education	24	24.7	23

All three studies showed in their population samples that the largest proportion of caregivers had a year 10 education level, fewer had a secondary certificate or post secondary qualifications, and the majority were born in Australia.

Bazeley and Kemp (1995) and the Wallis Consulting Group (1995) also determined immunization up-take rates (Table 2.5).

Table 2.5: The study and sample population parameters of immunization up-take in the studies conducted by Bazeley and Kemp (1995), and the Wallis Consulting Group (1995).

Parameters	Bazeley and Kemp (New South Wales)	Wallis Consulting Group (Australia-Wide)
Study Population Size (n)	316	1 000
Overall Immunization Up-take Rate (%)	85.1	82

Herceg et al (1995) determined the up-take rates for vaccination against different diseases, whereas Bazeley and Kemp (1995) and the Wallis Consulting Group (1995) determined generalized up-take rates for immunization, and so the up-take rates determined by Herceg et al (1995) cannot be compared with those determined by Bazeley and Kemp (1995) and the Wallis Consulting Group (1995).

It should be noted however that the overall immunization up-take rate determined by Bazeley and Kemp (1995) represent the New South Wales population, whereas the Wallis Consulting Group (1995) has determined the overall Australia-wide immunization up-take rate. However, the immunization up-take rates determined by both studies is greater than 80%. In Western Australia, the overall immunization up-take rate is 82% (Wallis Consulting Group, 1995). This rate shows that the immunization up-take rate in Western Australia is lower than that for New South Wales but is the same as that for the whole of Australia on average.

Bazeley and Kemp (1995) and the Wallis Consulting Group (1995) also considered immunization up-take rates and parental education level (Table 2.6).

Table 2.6: The immunization up-take level of parents against highest education level expressed as percentages of complete immunization, as determined by Bazeley and Kemp (1995), and the Wallis Consulting Group (1995) *(Education level of parents in sample population shown in brackets).*

Education Level	Immunization Up-Take (Bazeley and Kemp)		Immunization Up-Take (Wallis Consulting Group)	
Year 10	36.5	*(38.6)*	47.4	*(46)*
Year 12	36.0	*(36.7)*	31.3	*(31)*
Post Secondary	27.5	*(24.7)*	21.3	*(23)*

Both studies simply displayed their results, neither study discussed the statistical significance of their findings nor considered the possible causal relationship between parental education and immunization up-take rates. Both studies initially identified education as a key factor in immunization up-take rates, but did not conclude or determine how education affected immunization up-take rates. This lack of a clear relationship between immunization up-take and education presents a gap in the current understanding of education and decision-making towards immunization.

Another issue is that of incomplete immunization. Herceg *et al* (1995) found that risk factors for incomplete immunization included parents aged under 25 years, single-parent families, being a female care-giver, parents born overseas, high education, and having more than one child in the household, although this varied with diseases (Herceg *et al.*, 1995). However, both Bazeley and Kemp (1995) and the Wallis Consulting Group (1995) found that female caregivers supported immunization more than male carers (Bazeley and Kemp, 1995; Wallis Consulting Group, 1995). There is no indication of reasons for possible discrepancies in the findings of Herceg *et al* (1995), Bazeley and Kemp (1995) and the Wallis Consulting Group (1995). However, these

reports were not concerned with the reasons behind and/or why respondents answered the way they did. This is an important gap in public health knowledge.

2.4 The Anti-Immunization Movement – Underlying Beliefs and Values

Although the Australian and United States' Anti-Immunization/Vaccination Movements are the same in their ideas, the Anti-Immunization Movement in Australia is not as well documented. Influential groups within the Australian movement include medical doctors, chiropractors, homeopaths, and various other alternative medicine groups who are against the principles of vaccination. The movement focuses on health, not disease, and takes a positive approach to the treatment of disease in the form of prevention rather than cure. The movement believes that routine immunizations can be harmful, and that vaccination is not the primary factor that eradicates disease and boosts immunity. Members justify their beliefs on past evidence and trends (comparing vaccinations with disease eradication statistics), as well as present statistics on disease. Members also consider other contributing factors that cause disease such as clean water, effective sewerage and increased hygiene standards as important in disease prevention and eradication. The way in which vaccination can affect other systems in the body is also stressed (Lovett, 1990).

The underlying beliefs and values of the movement can best be seen in the controversy surrounding polio vaccination. The main case against polio vaccination is that the death rate from polio was decreasing before the vaccine was introduced, and that there is no

credible scientific evidence that the vaccine caused polio to disappear – cases of polio increased after mass inoculations (Figure 2.2 and 2.3) (McBean, n.d; Lovett, 1990).

Figure 2.2: The decline in polio cases in the United States after the polio vaccine was released according to the medical statistics (Lovett, 1990, p 11).

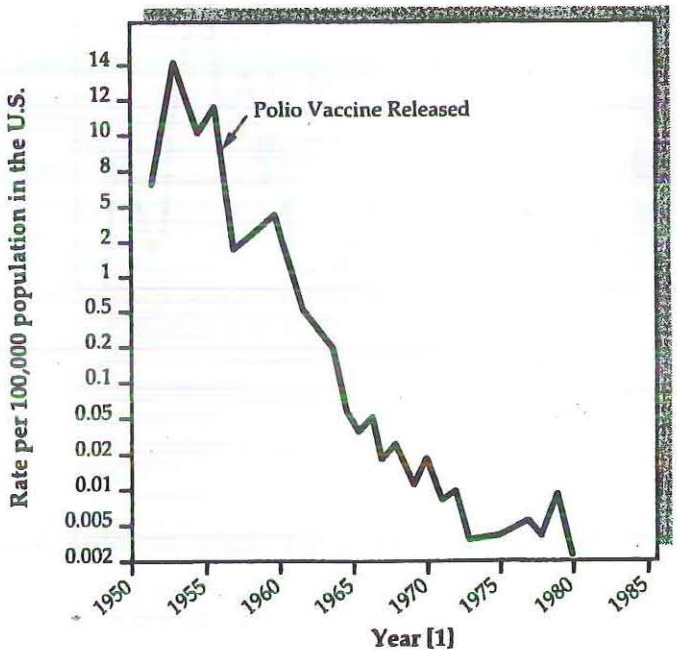
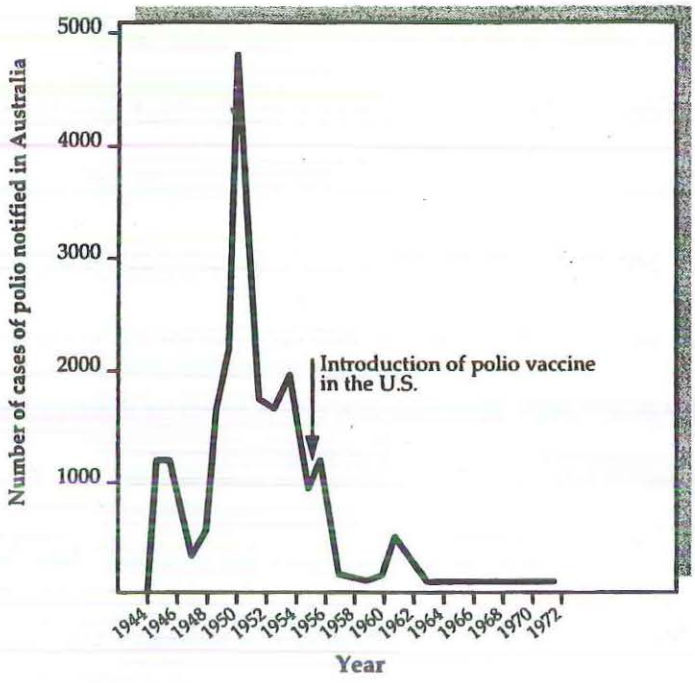


Figure 2.3: The decline in polio cases in Australia after the polio vaccine was released in the United States (Lovett, 1990, p 12).



On a scale from 1950 to 1985, the release of the Salk vaccine appears to have contributed to a significant decrease in the incidence of polio however, when that scale is altered to include dates from 1944 to 1972, it appears that the decline in polio began by about 1950 and subsequently, the vaccine was introduced by 1955. The anti-immunization movements interpret this information as suggesting that vaccination was not responsible for the decline in polio, but that perhaps better hygiene and nutrition were responsible (Lovett, 1990; Kalokerinos, n.d.). The Salk vaccine has also caused negativity within the movement as it has been linked at various times to the contraction of AIDS, cancer, Guillain-Barre syndrome, and leukaemia, due to contaminated serum, as the methods of producing polio serum have often involved the use of Rhesus macaques monkey kidneys (Martin, 1996).

Members of the Anti-Immunization movement believe that the incidence of disease is linked to many factors, and if these factors are manipulated or removed, recovery is certain (Lovett, 1990; Kalokerinos, n.d.; McBean, n.d.). McBean points out that the description of an acute polio virus infection is almost identical to vitamin B_1 deficiency-caused damage (beri beri) which is commonly caused by dextrose and alcohol as well as eating white rice (McBean, n.d.). Vitamin C has also been used in the treatment of polio and other diseases (Kalokerinos, n.d.). However, one of the most common beliefs of anti-immunization movements is that disease reduction has more to do with public health measures such as clean water and sewerage rather than vaccination (Kalokerinos, n.d.; Lovett, 1990), where it is stated that "Diseases are crises of purification, of toxic elimination" and "There is but one cause of disease, poison toxemia, most of which is created in the body by faulty living habits and faulty elimination" (McBean, n.d., p 9).

There are many alternative treatments for disease. Two of these are homeopathy and chiropractic. Homeopathy works in totally different ways from conventional medicine, which is known to homeopathic practitioners as allopathy. Allopathy means "different from the suffering" - the drugs that are given work against the disease. Therefore, the drugs that are used in allopathy are labeled "anti" such as anti-biotics (Hammond, 1995; Murray, 1996). Homeopathy in contrast, means "similar to the suffering", where remedies used to treat sick people are actually capable of producing similar symptoms in a healthy person to those present in the patient needing the remedy (Murray, 1996).

However, according to chiropractic, the nervous system controls and co-ordinates every function in your body and the nervous system controls the function of different organs which secrete chemicals which keep the body chemistry in balance. Interference with

the nervous system to any of these organs or tissues causes the function of that organ to break down, resulting in disease including infectious disease. This is the foundation upon which chiropractic functions (Lovett, 1990; Homola, 1998). The function of chiropractic is to increase your body's own ability to fight diseases. It can increase and help improve the function of the immune system without toxic harmful chemicals such as vaccinations and antibiotics (Lovett, 1990; Homola, 1998).

At the conventional end of public health, medical and government health authorities firmly believe that routine immunizations are the best and only way to protect children and adults from disease. At the alternative end of public health, practitioners firmly believe that routine immunizations are harmful and more natural methods should be used to prevent and treat disease. Both groups base their ideas on different models of how the body and the immune system operate. Parents who must decide whether to immunize their children are not only faced with a choice of two differing opinions and methods of immunization, but also with whether or not to immunize at all, and must also face the risks associated with whatever decision they make.

Chapter 3: LITERATURE ON DECISION-MAKING

3.1 Decisions on Risk

Immunization poses a major decision for parents. They have to decide whether or not to immunize their child, and this involves a degree of risk perception. Risks are involved with either decision, and parents generate their own perception of risks based on factual evidence (e.g: statistics) as well as trust (e.g: government, doctors, etc). Parents then decide which decision is the best for their child. The decision that is made is reflected in immunization up-take rates.

Risk assessment, as a quantitative science, includes hazard and risk identification, and subsequent calculation of risk. In these situations, "The conventional definition of risk is the product of the degree of harm a given event would cause, and its probability of occurrence",

$$R = P \times C \text{ (Wynne, 1987, p 273)}$$

Where, R = Risk
P = Probability of occurrence
C = Degree of harm.

The literature on the risks associated with pertussis infection provides quantitative data on death from disease. Other complications are only described qualitatively (Willems *et al.*, 1998; National Health and Medical Research Council, 1997; Cowan *et al.*, 1993). However for this study, it is the participants' perception of risk that is of key importance. In this context, Beck's definition of risk as "a systemic way of dealing with hazards and insecurities induced and introduced by modernization itself" (Beck, 1992, p 21), is more appropriate. Vaccination is a technology which has been developed through

the advances of biology and medical science. In this respect, technology can be seen here as referring to physical objects associated with vaccination as well as human activities, reflecting MacKenzie and Wajcman's (1985) definition of technology as, "what people *know* as well as what they *do*. Technology is knowledge" (MacKenzie and Wajcman, 1985, p 3).

Within risk perception and decision-making processes there lies an element of trust. Wynne (1996) points out that "the problems of who to trust arise because expert bodies have betrayed trust by not protecting society from the now-pervasive risks 'out-there'" (Wynne, 1996, p 76). The public has witnessed or heard of catastrophes or disasters which could have been avoided or rectified with correct expert intervention. Such events cause the public to lose trust in authorities (Wynne, 1996).

An example of a breakdown of public trust can be seen in the recent nuclear accident in a uranium processing plant in Tokaimura run by a company called JCO, 140 kilometers northeast of Japan. Japan is dependent on nuclear energy for power production. Workers had apparently poured 16 kg of uranium into the sedimentation tank, enriched so that 18.8% was the fissible isotope uranium-235. It formed a critical mass and started a chain reaction, which caused a flash of blue light as the air was ionized by radiation (Hadfield *et al.*, 1999). Three hundred thousand people living within 10 km of the plant were told to stay indoors to avoid exposure to radiation (Reuters, 1999a; Reuters, 1999b). Nuclear experts were astounded that the plant did not have in-built safe-guards that would have made errors impossible.

The experts also claim that the plant had been using a method for processing highly enriched uranium that was undoubtedly risky (Hadfield *et al.*, 1999). It is thought by authorities that the accident may have happened because workers weren't used to handling highly enriched uranium. Authorities are also baffled at why the technology allowed the workers to do what they did. Clearly, the crisis in Tokaimura represents a serious case of public mistrust due to authoritative neglect and failing. The public will needlessly have felt let down by this disaster, and their trust in the authorities is likely to diminish. In the case of immunization, previous experience whether direct or indirect (word of mouth, media exposure) can and does affect the public's and the individuals' view of certain technologies. This can in turn affect their perception and decision-making towards that particular technology or application.

The way in which the public interprets science and technology can also affect their decision-making processes and final decisions. This is also linked with public education and their understanding of both science and its practice. Government agencies often believe that "public education is seen as the best way to win over support – if only people knew the facts then they would not worry unduly" (Irwin and Wynne, 1996, p 2). Then perhaps, the public would view risk and trust in a different light, and thus generate better informed decisions. However, such views ignore the inherent uncertainty in science itself. According to Irwin and Wynne (1996), a "Better overall understanding of science would ... significantly improve the quality of public decision-making, *not* because the 'right' decisions would then be made, but because decisions made in the light of an adequate understanding of the issues are likely to be better than decisions made in the absence of such an understanding" (Irwin and Wynne, 1996, p 5).

Within the public, there exist various levels of understanding of the issues involved with immunization. The process of decision-making in this area is complex. On one hand, there lies the intellectual basis for immunization, while on the other hand, the emotional response towards immunization is present. This difference in beliefs and values can affect the risk perception of immunization, which in turn will affect the decisions that are made by parents.

3.2 Medicine as a Commodity

Vaccination is "sold" to the public as a necessary health service. Vaccines are "sold" to doctors or health service providers by pharmaceutical industries. This process is done through the media. The media is a powerful tool and can play an important part in medical advertising. The way in which commercials, articles, advertisements, pamphlets and brochures are assembled, and the way the information is conveyed, can influence the audience in certain ways, as well as their decision towards the product or service. The function of advertising is to sell commodities. Its purpose is to distinguish between brands of products that in reality have little difference from one another. In doing so, "the latent functions of advertising are generated: the construction of a specific image and the giving of meaning to a product" (Lupton, 1993, p 805), thereby positioning the product in a certain niche.

Advertising in medical journals and magazines uses similar methods to sell products, but the main difference is the audience to which the advertisements are being targeted. Using pre-existing consumer responses to advertisements, advertisers have made efforts

to make the images associated with their products into those that they believe are viewed as acceptable, understandable, and desirable by the medical profession (Lupton, 1993). Although drug advertisements in medical journals directly reflect the attitudes of doctors to their patients, it can be assumed that "many doctors would find the advertisements meaningful, acceptable, and to some degree, persuasive" (Lupton, 1993, p 806). In order to understand the dimensions of medical advertising, an examination of the recurring visual symbols and expressive devices is important. This in turn reveals the "ideologies and mythologies surrounding the doctor-patient relationship in the context of the biomedical system of healing" (Lupton, 1993, p 807).

In one study of medical advertisements conducted in the United States, it was found that the traditional symbols of the medical practitioner (white coat and stethoscope) were used less frequently over the past few decades, in favour of images depicting science in action, complex medical technology, and the potency of drugs (Krantzler, 1986; Lupton, 1993). Moreover, it was stated that "physicians tend to be manipulators of technology behind the scenes. They are rarely shown talking to patients, more rarely yet talking to nurses or each other ... the tendency is to show brightly-coloured, high-tech imagery, such as computer simulations, and to focus on scientific evidence of efficacy" (Krantzler, 1986, p 937).

According to Lupton (1993), "The trend toward widening the social gap between patient and doctor has been emerging in the medical media for some time". A comparative analysis conducted by Neill in 1989, showing the changes in patient and doctor representations in American psychotropic advertisements between 1955 and 1980, noted "the emergence of a greater distance between doctor and patient, with the patient

becoming more passive and dependent while the doctor changed from caring collaborator to someone applying treatment" (Lupton, 1993, p 807; Neill, 1989). Contrary to this, in recent times the move for increased patient involvement with the public health system has been encouraged by public health authorities, as stated by the NHMRC (National Health and Medical Research Council, 1993).

From the studies conducted by Krantzler (1986) and Neill (1989), it was inferred that "It is as if the doctor is only a mediator between patient and drug, a shadowy figure lurking in the background, the necessary authority who signs the prescription but provides little else of relevance to the patient's relationship with drug therapy" (Lupton, 1993, p 816). "Such depictions serve to reinforce, for the medical readership of the magazine, the social and emotional distance between patients and doctors, and in the case of female patients, can perpetuate a patriarchal relationship between the doctor, imputed as male, and the female patient, imputed as helpless and dependent upon the beneficence of the doctor" (Lupton, 1993, p 817).

It is not only medical companies that utilize the media for health advertising and promotion purposes. Government health departments too can benefit from the media in order to promote new and existing public health strategies and schemes. This is evidenced by the numerous pamphlets and brochures that are produced (samples relating to this study are found in Appendix 4.2).

Chapter 4: METHODOLOGY

4.1 Theoretical Framework

I began this study with an acceptance of the traditional medical paradigm, and belief that immunization is important and necessary in order for protection against disease and illness. Such an approach might be expected after a three year undergraduate biological science degree. I was therefore surprised to find from television, newspaper and magazine articles, that medical and health authorities were telling the public that immunization rates were too low and that parents were not immunizing their children. Such articles and programs constantly stressed low rates, but no reasons for these low rates were supplied. I became curious as to what the causes for these low rates were, and felt that these low rates might reflect parents' attitudes towards immunization, which would in turn affect their decisions. Therefore, I started an exploration of the mechanisms underlying the interactions between immunization rates and parental decisions.

It should be noted however, that all research projects carry some bias. One way of dealing with bias is by fostering an awareness that a bias does exist, and making it explicit and documented as well as continuously monitored. In this study, being a scientist and accepting the medical paradigm can pose a potential bias toward the push for vaccination, however I view this bias as the source of the curiosity that prompted me to initiate this study, and in this regard, I can uncover more issues concerning immunization and decision-making than have been identified in the literature.

Demographic data on the immunization status of Western Australia for whooping cough is available (Health Department of Western Australia, 1995), as well as information concerning the immunization registry and immunization schedules (National Health and Medical Research Council, 1997). While some work has been done by the Wallis Consulting Group (1995) concerning parental attitudes towards immunization, that study did not explore parental decision-making processes. The outcome of the decisions parents make concerning immunization, and the parameters under which they are made (age, education, ethnicity, etc) are documented in the literature (Herceg *et al.*, 1995; Bazeley and Kemp, 1995; Wallis Consulting Group, 1995), but the interactions that take place between these factors and the mechanisms by which parents come to their decisions are unknown.

During the study, I became aware that the issue was more complex and that people view the body and other issues (such as education) in different ways, and from different paradigms, all of which are important not only to this study, but also to public opinion. I respect all of these viewpoints, and although I still accept the medical paradigm, and would choose to vaccinate my children and be vaccinated myself, I am more aware of different belief and value systems. The area of decision-making concerning immunization is poorly understood, and is an appropriate and timely area of research.

The literature suggests parental education as a possible factor affecting immunization rates (Herceg *et al.*, 1995)(Bazeley and Kemp, 1995), however, other factors such as the roles of personal past experience, health department information, information given by doctors, and access to biological models of immunity, were not considered.

The research technique used in this study had similarities to that carried out in the United States on patients who were trying to quit smoking, where patients' reasons and deciding factors for quitting smoking were mapped by the American Psychiatric Association (American Psychiatric Association, 1996). In that study, subjects were recruited by advertisement and referral by family practitioners. Eligibility was assessed first by telephone interview and then a face-to-face interview with a physician. To be eligible the smokers had to have smoked at least 15 cigarettes per day for at least 5 years, and be 18-65 years old. A total of 101 subjects were obtained, and after a complete description of the study to the subjects, written informed consent was obtained.

The methodology used in the smoking study involved conducting interviews with participants, much like this study. In the interviews, the reasons and risks for the actions of the participants towards quitting smoking were explored. This interview information was connected to smoking intake and reasons for quitting in smokers. In the findings, the attitudes and outcomes of the decisions made by the participants towards quitting smoking were discussed. The social context of the decision made to quit smoking was also outlined (American Psychiatric Association, 1996; West and Hajek, 1997). The reasons that subjects gave for trying to stop smoking were to improve health, and in response to social pressure. The reasons of patients who did not try to quit smoking were fear of weight gain, fear of withdrawal, and fear of failure (American Psychiatric Association, 1996).

The smoking study also suggested that quitting smoking can expose subjects to a case of risk. Smokers who do not quit are exposed to an element of risk of developing increasing dependence on nicotine and subsequent increased risks of developing cancers, while smokers who do quit smoking are exposed to an element of risk of developing serious nicotine withdrawal symptoms. Social risks were also identified. For smokers attempting to quit, social support was found to be a major predictor of sucess. If others in the household were current smokers, their willingness to quit at the same time as the patient or not to smoke in front of the patient needs to be considered. Whether and how others in the household and friends have supported or undermined prior quit attempts were also assessed (American Psychiatric Association, 1996). Other smoking-related studies have found similar findings (Hall *et al.*, 1998; West and Hajek, 1997).

A parallel risk with this study is that if you immunize your child, you may be exposing them to an element of risk associated with vaccine side-effects, however, if you do not immunize your child, you may be exposing them to an element of risk associated with contracting the disease. Likewise socially, the pressure from medical and health authorities towards vaccination can affect a parent's views on immunization and will affect the decision they make. The possible reasons behind parents' decisions concerning the immunization of their children are not documented as well as those for smoking, nor are the elements of risk associated with decision-making.

4.2 Qualitative Research

Case studies examine a particular case to provide insight into an issue or refinement of theory (Stake, 1994). In this study, the participants were recruited from Edith Cowan University, Mount Lawley Campus, as part of a University case study. A University case study was the most appropriate method of investigating the issues behind immunization decision-making, because it ensures that students will be mature aged and that the sample population will be random in nature, however it was also a convenient method or recruiting participants given the time constraints for the study.

Qualitative case researchers usually call for "letting the case tell its own story" (Stake, 1994, p 239). The use of qualitative research designs is being used increasingly across a variety of disciplines. Although methods of data collection and analysis vary within and between disciplines, most rely on obtaining some kind of narrative as a means for gaining insight into phenomena (Stuhlmiller and Thorsen, 1997). "Narratives are useful in qualitative research, as they relate to individual experience in order to gain insight into the constructs of society and culture, and by doing so, place the experience within the context of the individuals' life history" (Brody, 1987, p 2). Narratives can be used by academicians, researchers and clinicians as a means for "peering into human experience" (Stuhlmiller and Thorsen, 1997, p 141). The narrative is usually provided through an interview.

There are two types of interviewing: structured and unstructured. Semi-structured interviewing falls under the category of unstructured interviewing. Structured interviewing refers to a situation in which the interviewer asks each respondent a series

of pre-established questions with a limited set of response categories, while unstructured and semi-structured interviewing offers open-ended ethnographic, in-depth questions, thereby providing a greater breadth of response than other types of interviewing (Fontana and Frey, 1994). The idea behind semi-structured interviewing is for the interviewer to have some general topics he/she wishes to know about (in this case demographic data, past personal experience, past education, public health department information, interpretation of scientific/medical information, and models of immunity and immunization), but not to use closed-ended questions or a very formal approach to interviewing (Fontana and Frey, 1994). Such an approach does not constrain information from interviewees to a pre-determined format, therefore this approach was useful in this study, and worked well in extracting a broad response from the interviews.

Semi-structured interviews present the interviewer in a somewhat directive role, where the setting is preset and the purpose of the interview is to obtain phenomenological data (Fontana and Frey, 1994). The interviewer commits what structured interviewers would see as two capital offenses": he/she answers questions asked by respondents, and he/she lets his/her own feelings influence him/her thus deviating from the ideal of a cool, distant, and rational interviewer (Fontana and Frey, 1994). Research has shown that in order for the interviewer to *communicate* effectively with subjects, the following actions are important:

- listen *attentively* to participants
- *accept* what they say
- be *understood* by them
- be *truthful* and *sincere,* and
- act in a socially and *culturally appropriate* way (Stringer, 1996).

Also, interviews take time, and if sufficient information is to be gained, they can not be hurried. In this study, interviewees were interviewed for as long as was needed for them to finish their discussion. These suggestions were incorporated in this study into the interview technique, as part of the interview discussion, and by applying these, the interviews were more relaxed and open to discussion. The interviews became more conversational rather than directive. They were effective in breaking down the barrier between interviewee and interviewer, thus allowing a broad range of information to be gathered from the interviews.

Structured interviews aim at obtaining large amounts of data, which is significant enough to form correlations between pre-established categories, but is too shallow to explain the behaviour within these categories, whereas semi/unstructured interviews have a small sample size, are in-depth, present rich data, and are used as an attempt to understand the complex behaviour of individuals without imposing any categorization that may limit the field of inquiry. In order for the interviewer to successfully determine and interpret the information from the group he/she wishes to study, he/she must place him/herself in the same shoes as the group being interviewed (Fontana and Frey, 1994). In this study, this was done by fostering an awareness of the feelings involved in decision-making processes, as well as being non-judgmental towards whatever the participants said. This approach was helpful in placing the interviewer in the interviewee's place, in order to acquire more meaningful rather than abstract information.

Narrative goes together with the mental images that transform the experience into verbal communication. In this process, the recollection of an experience involves the

reconstruction of visual pictures. This approach was defined by Stuhlmiller and Thorsen (1997) as "narrative picturing", where "private visualization" (mental images) is combined with "verbal narration" (verbal communication of mental images) (Stuhlmiller and Thorsen, 1997, p 141-142). Selected visual images were integrated into the interview technique (see Appendix 4.1). The 19 images were spread out on the table and the participants were asked questions about how they felt they related to immunization and immunity. The images served as prompts or suggestions. The images were used not only to understand the participants' ideas of immunization and immunity, but also to encourage participants to discuss their experiences. Participants were also shown a series of Health Department pamphlets about immunization, in order to interpret their attitude and familiarity toward government and medical information. This proved very successful, as the participants were encouraged to discuss the pictures, but also to draw on personal experiences using the pictures as prompts.

4.3 Research Procedures

In order to recruit participants, posters were placed around the campus on the main notice boards inside the buildings and inside the medical and childcare centres (Appendix 1.0). Parents who had children between the ages of 2 months and 6 years were sought. It was hoped that the response would generate a large enough pool which could be stratified according to those who did and those who did not immunize, and then participants could be randomly selected from these two groups, however the response was small and participants "filtered" in. It was therefore necessary that the participants were chosen for interviewing in order of first response. Willing participants

were sent a consent letter and a release form which they were asked to sign and bring with them on the day of the interview (Appendix 2.0 and 3.0), and were given an interview time over the phone. When conducting interviews, there is always a possibility that participants will not be present on the interview day. In order to overcome this, all participants were placed on a list, and the first few participants were given a time for the interview. If the participant did not arrive as was the case with one respondent, they were contacted after 24 hours so that a new interview time could be arranged. In this case, the participant could not be contacted therefore another participant was taken from the list in order of first response to take their place. Late applicants and one applicant who wished to be included in the study only if there was a shortage of participants, were sent letters to inform them that the positions had been filled, and were thanked for their patience and co-operation.

Initially, a pilot study was conducted to test the interview questions and interview technique. Two subjects who were students at Edith Cowan University (Mount Lawley Campus) and were also parents were recruited by word of mouth. They were interviewed using the interview questions (Appendix 4.0) and were also shown images as part of the interview technique (Appendix 4.1 and 4.2) that was to be used on the subsequent participants. These and all subsequent interviews were audio-taped, and brief notes were made. The audio-tapes were transcribed. After the interviews, the process was discussed with the participants in terms of the open-endedness of the interview questions and the technique used. The two participants in the pilot believed that the interview questions were acceptable and would not be offensive or intrusive to subsequent interviewees. They believed that the images were a good addition to the interview, and made the interview process more interesting. They also believed that the

interviewer was polite and unobtrusive. While these comments provided some feed-back on the experimental method, it was felt that they were too positive and did not identify possible loop-holes in the interview technique. In order to overcome this, the audio-tapes were critically analyzed for language sensitivity and the response generated by the interview questions.

The audio-taped transcripts were carefully read and analyzed for the efficacy of the interview questions. The questions worked well and obtained sufficient responses, however the images did not receive the response that was expected. The first participant was describing the images rather than talking about their relationship to immunization and immunity. In order to overcome this, half of the scientific images of bacteria and viruses were substituted for more archetypal pictures like trees and landscapes, and the images were changed for colour copied ones. The images were brought in after the participant's idea of immunity was discussed so as not to influence their thought pattern. This was trialled with the second pilot and found to be successful.

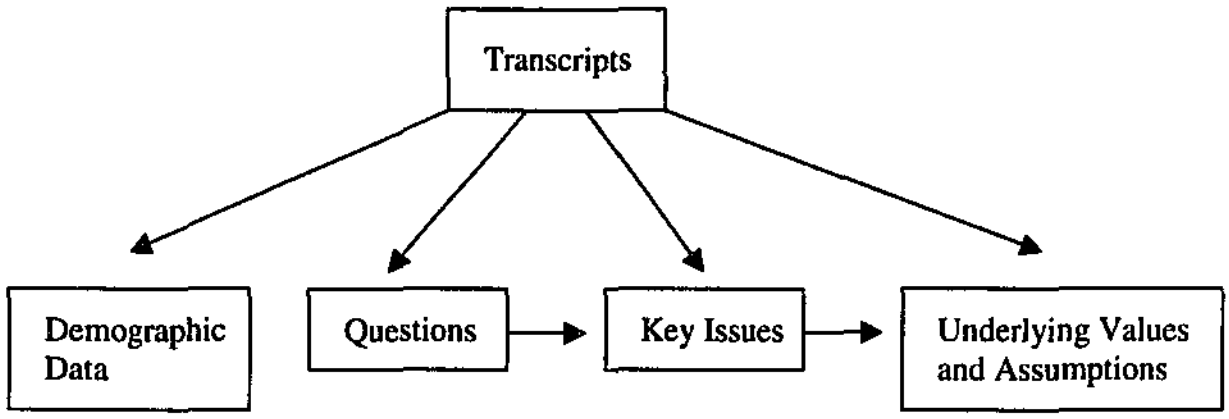
The role of the interviewer was also analyzed in the interview process in terms of the language used, and whether the language was judgmental or impolite. No changes needed to be made to the language used by the interviewer, although the question concerning the participant's age was reworded to allow the participant not to answer the question. These helped to improve the interview process for subsequent interviews. On average, each interview lasted for 45 minutes. The remaining six interviews were conducted with the alterations made after the pilot interviews. The alterations proved successful in obtaining the sufficient information from participants, and the interview method was finalized. Data analysis took place in parallel with the interview process.

The two pilot interviews gave an example of what key issues could be identified, and any new issues that were identified were added to the list of issues. In a sense, the pilot interviews provided a framework for the type of information that could be expected to be obtained from the subsequent interviews. However, this framework was dynamic and information was constantly being added with each interview.

4.4 Data Analysis

The interview transcripts (approximately 3 000-5 000 words on average) took between 5–8 hours on average to transcribe. When transcribed, they were coded by hand rather than by computer program (NUD•IST) because it was felt that a better understanding of the data could be obtained if coded manually, and also because of the time constraints placed on the project. The overall data analysis process can be seen in Figure 4.1. The process used for coding involved photocopying the transcripts several times so that the transcripts could be coded by question, by key issues and by underlying values and assumptions. The photocopied transcripts were divided into sections according to the interview questions (question 1, question 2, etc) for easier analysis, and these sections were placed in manila folders labeled according to the interview questions. The whole transcript was then coded for key issues.

Figure 4.1: Methodology map displaying the process of data analysis.



Coding was a lengthy process averaging around 2 hours for each interview. This involved reading through the transcript carefully and analysing the data to find the key issues that were important to the decision made by the participant concerning immunization. The key issues were identified by the relevance of the statement to the decision-making process of immunization. The key issues identified in the transcripts were marked in the transcript and on a summary sheet that was marked in conjunction with the transcript. This information was then placed in a "key issues" manila folder. This was done for each interview. When all the transcripts had been coded for key issues and placed in the "key issues" manila folder, the key issues were then grouped into categories of similarity.

The transcripts were also analyzed for underlying values and assumptions. These were identified in the transcript according to the language used to make a point and/or the context in which the point was made. These were marked in the transcript and then cut out and categorized in manila folders according to what the underlying values and assumptions were. Within these categories, the cut transcript sections as well as notes

about the transcript were stored. These categories were the values and assumptions that underlied the key issues concerning immunization decision-making.

4.5 Ethical Considerations

In order to ensure the confidentiality of the subjects, all written records, floppy discs, sound recordings and written analyses were stored in a private filing cabinet with a locking facility in the postgraduate study laboratory throughout the duration of the study. The anonymity of the subjects was preserved and names were substituted with pseudonyms. No data was left on any computer hard drive and all material was transcribed by the interviewer. These procedures were in accordance with the approval given by the Committee for the Conduct of Ethical Research at Edith Cowan University.

There was also the possibility that some participants may have been unable to answer some questions if they found them emotionally upsetting. This did not occur in the interviews, but if it had, their response would have been included in the findings, and for the subjects' well-being, a visit to the student advisors/counsellors on campus would have been suggested. The subjects' right to stop the interview at any time was clearly stated on the consent form.

4.6 Limitations

It would have been preferable for a stratified sample to have been taken, according to parents who did and those who did not imm ze their children. All parents interviewed had immunized their children, however due to a lack of time available for recruiting participants, participants were interviewed regardless of their child's immunization status.

It was hoped that some parents who hadn't immunized their children could have been interviewed. The reasons why parents who did not immunize their children didn't volunteer is not certain. Any number of factors may have been responsible. Firstly, there was a lack of time. Given more time to recruit subjects, parents who hadn't immunized may have been recruited. Secondly, pressure may have discouraged these parents from coming forward. Since the pressure in our society is for vaccination, the fact that these parents did not vaccinate their children may have made them feel reluctant to come forth and discuss their reasons and ideas towards the subject.

Chapter 5: RESULTS

Eight parents were interviewed, including two that were part of the pilot study. Five females and three males were interviewed, and all the parents interviewed had immunized all of their children with the combined DTP vaccine. The average parental age was 35, they had an average of 2.6 children, with an average age of 6 years and 7 months. The education level of the parents interviewed at the time of first becoming parents ranged from year 10 to postgraduate qualifications. When becoming parents for the first time, four parents had completed year 12, 1 parent year 10, 1 parent year 11, 1 parent second year university, and one had completed a Masters degree. The two pilots are included in the data set as there was no significant change to the interview between the pilot and sample interviews. The preliminary analysis identifies key issues, groups them into 4 categories, and analyses each of the categories in further detail.

5.1 Key Issues

The interview tapes were transcribed, coded and analyzed. This analysis initially identified 20 key issues that influenced parents' decisions towards whooping cough immunization. These issues were diverse and ranged from personal to societal issues, and are listed in Table 5.1 along with representative quotes. Not every parent interviewed identified each key issue as pertinent to their final decision. For most parents, a few issues were particularly important and were referred to several times throughout the interview. However, all 20 issues were identified by different participants at different times in their discussions. The twenty key issues that were

identified were not discrete. An overlap existed between key issues and many issues were closely linked. The quotes for issues 4, 7, 8, 12, 14, 17 and 19 illustrate the overlap which commonly occurred. This made the categorization of key issues difficult. The categories were also established to help answer the research questions.

Table 5.1: The best representative quotes obtained for each of the initial twenty key issues (*Overlap between key issues is shown in brackets*).

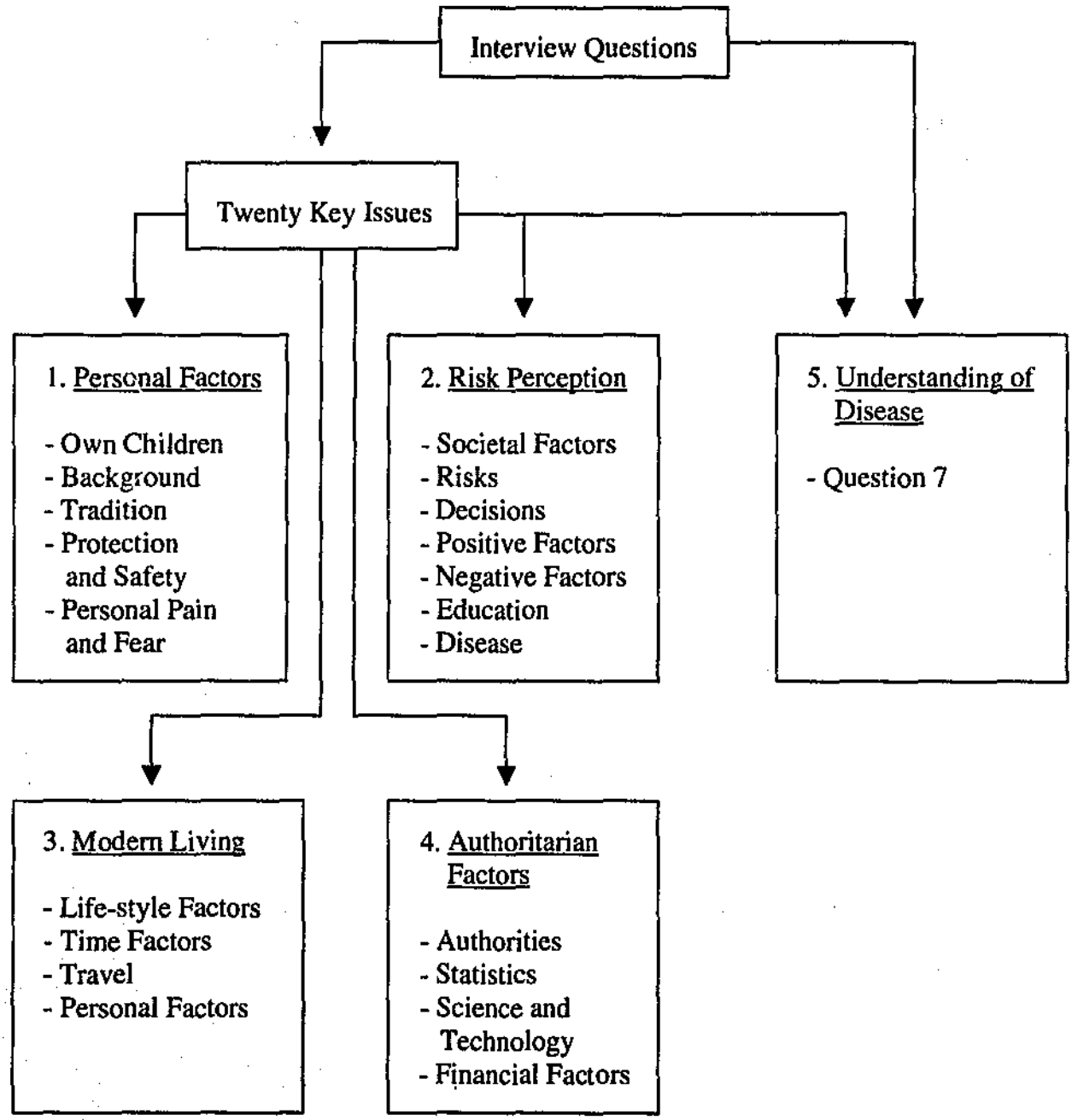
Key Issue Number	Key Issue	Number of parents who identified the issue as a key issue	Representative Quote	Source
1	Risk	5	*"I know there may be a slight risk with immunizing them, I think there's a greater risk if they're not immunized"*	Interviewee 2
2	Tradition	3	*"I guess it's just the way I've been brought up"*	Interviewee 6
3	Decisions	5	*"I probably still would have done it because once again I'm at liberty to"*	Interviewee 4
4	Protection and Safety (*Risk*)	2	*"I never thought of them being sick by being immunized, I always thought of them being protected against certain diseases"*	Pilot 1
5	Own Children	3	*"The decision comes because they are my children and I love them, and I don't want anything to happen"*	Pilot 2
6	Authorities	5	*"I find that doctors are very quick to poke a needle ... I don't think a lot of people like to be treated as guinea-pigs"*	Pilot 1
7	Statistics	3	*"We were told that it was good for the kids and the side-effects*	Pilot 2

	(*Authorities*)		*are very minimal, so when somebody gives you that sort of guarantee, you feel more confident"*	
8	Positive Factors (*Protection and Safety*)	5	*"It is still benefiting to children because in all cases you do get sick, but most of the time we do benefit the children"*	Pilot 2
9	Negative Factors	1	*"I just think that's too many in too short a time"*	Interviewee 4
10	Background	2	*"I'd always been used to immunizations in the navy"*	Interviewee 1
11	Societal Factors	3	*"I think it's in some ways a public or community responsibility to do it"*	Interviewee 2
12	Disease (*Negative Factors*) (*Risk*)	3	*"I'm aware of all the consequences of disease and what happens if they're not immunized"*	Interviewee 6
13	Financial Factors	3	*"The biggest influence was the financial incentive, the $200"*	Interviewee 3
14	Travel (*Risk*)	1	*"Especially now that we travel more these days ... it's more important"*	Interviewee 3
15	Education	1	*"I think if people are educated, or choose to be educated, then they can make the decisions"*	Interviewee 3
16	Personal Factors	1	*"We talk about it and continue to talk about it now as being a primary thing of importance"*	Interviewee 1
17	Personal Pain and Fear (*Negative Factors*)	2	*"You don't realize that there's hidden dangers or anything"*	Interviewee 5
18	Life-style Factors Due to Modern Living	1	*"I'm a very healthy, natural person ... my deep seated belief is you are what you eat ... I'm the last person to go to the*	Interviewee 4

			doctor ... food, healthy diet, being happy and that sort of thing comes in"	
19	Time Factors (*Authorities*)	1	*"You just accept the facts, you don't question, you don't have time to question everything"*	Interviewee 5
20	Science and Technology	1	*"We have the technology and we have the science to be able to protect children against diseases"*	Interviewee 6

Further exploration of these links generated four categories of key issues (Figure 5.1). These four categories are not independent. They are interrelated in many ways and this relationship is complex. The four categories were produced through careful analysis of the language used by parents when discussing the key issue and by analysis of interviews in their entireties. Similarities in the language used and the context in which the issue was raised was used to identify connections between issues. When these strong connections had been identified the issues were grouped. For example, the issue of risk was seen by participants as a separate issue from immediate personal factors. Parents' understanding of disease has been included as a separate category. Participants were specifically asked about their understanding of disease and did not raise the issue. Parents' levels of understanding in this area were initially considered to be important because their understanding of science provides a framework for interpreting data supplied by authorities. The four key issues categories and parents' understanding of disease models are explained in further detail.

Figure 5.1: The four key issue categories generated by grouping the twenty initial key issues and parents' understanding of disease category.



5.1.1 Personal Experience

Personal experiences were important to five of the eight parents interviewed. Personal experiences included their own family tradition, personal experiences as a child, and

experiences as parents. Family tradition was a frequently discussed area. A typical quotation concerning family tradition is seen below.

> *"It's because my mother did it with her children that I had to do it with mine, we were immunized as children, therefore my children had to be immunized, I wasn't going to do anything that was completely against the books of our upbringing, so you take this learnt behaviour to some degree through to your own family"* (Pilot 1).

For this parent, tradition was important to the decision that was made, and this tradition or "learnt behaviour" was brought into their own family. Immunization was part of this family's tradition of health care. Personal experiences as a child, and the memories that remain from experiences also play an important role in parents' decisions to immunize their children. For one parent, their family member's experience with disease played an important and valuable role in their own visual experience with disease.

> *"I had an uncle who got polio unnecessarily in a time when polio vaccinations were available ... he's a bit older than me but that continues to be something that I think about ... so that highlights in my life ... I'd always been used to immunizations in the navy"* (Interviewee 1).

This parent felt that vaccination could have prevented their family member from contracting polio at a time when the vaccination was available. He continued to think about their uncle's situation, and this was an important part of his decision to immunize. The fact that he had been immunized in the navy many times provided a familiarity with immunization procedures and that immunization is not an ordeal but something that is done. This interviewee also implied that if it was safe for themselves, it will also be safe for others as well as their children. Parents' emotional links to their children, also played an important role in the decisions parents made towards immunizing their children.

> *"Your children are very precious at that age, at any age, but at that age particularly because they are so vulnerable and little, you want the best for them ... because you want the best, you want to take care of them in*

the best possible way, ..., I thought of immunizing against such nasties because you want them to be healthy, I never thought of them being sick by being immunized, I always thought of them as being protected against certain diseases ... I didn't give it a thought" (Pilot 1).

"For safety, because as we know, a lot of diseases can creep up and they can hurt children, either cripple them or even kill them, ..., so when somebody says to you that immunization is benefiting for the children, then you take your best step" (Pilot 2).

Parents' feelings toward their children and toward immunization can sometimes conflict, but for this group of parents, as expressed by Pilot 1, their children are precious and vulnerable and as parents, they want the best for them. Immunization was the best solution towards protecting them from disease and safe-guarding their health. The negative aspects of immunization (side-effects) were less important to these parents than the safety of their children through immunization. Immunization was viewed as a means of protecting and ensuring the safety of children, and is important if you want the best for your children.

The five parents for whom personal factors played an important role in the decision they made, strongly believed that if you want the best for your child, you will immunize them to protect them against disease and ensure their safety, because children are vulnerable to diseases. Generally, these participants felt that if their parents had immunized them as children, it would be safe to immunize their own children.

5.1.2 Risk Perception

The risks involved with immunization were discussed by all parents interviewed. Parents' views and understanding of risk factors were broad and ranged over many

areas. Three levels of risk were identified. They were personal risks involved in decision-making, the personal understanding of the consequences and effects of disease, and societal or public duty.

Parents talked about their weighing of risks in the decision-making process and this provided data on their personal risk perception.

> *"My decision, that's a personally constructed one ..., you get your information and you make your own mind up"* (Interviewee 4).
>
> *"I think if people are educated, or choose to be educated, then they can make the decision"* (Interviewee 3).

Parents came to their own decisions about immunization by considering existing information about immunization, whether personally obtained or given to them, weighing the personally perceived risks with each possible decision and then making the decision that they believed was best for their children.

The knowledge of the effects and consequences of disease and the risks involved with contracting a disease was an important factor in the decision parents made to immunize their children.

> *"I'm aware also of the consequences of the side-effects and I've made the decision that it's better to immunize, even though there's a risk, than to have my children exposed to those particular diseases, ..., I really believe that children should be immunized because ..., I'm aware of all the consequences of disease and what happens if they're not immunized"* (Interviewee 6).
>
> *"Immunization like everything else has got its positive and negative side, a lot of parents who did not immunize their children, and their children ended up being sick, then they decided immunization was the best step they should have taken, ..., when you cough too often and very loud, you ruin your throat and everything inside you will suffer, and as the whole body is suffering physically, the child will suffer, mentally too ... an ongoing cough can have a mental affect too"* (Pilot 2).

> *"I suppose just being aware of how disastrous whooping cough is and how bad that condition can be"* (Interviewee 2).

For these three parents, their passed-down knowledge of the effects, consequences and the negative aspects of disease were important to their decision to immunize their children. The consequences of disease made immunization all the more important, and these parents assessed that deciding not to immunize their children would have been far more risky than immunizing them. This decision would have been made when the risks associated with disease contraction and the risks associated with vaccine side-effects had been weighed through the "lens" of family tradition.

The social or public duty that parents had to immunize their children and reduce the risk of infection in the community generally was also considered important by two of the eight parents interviewed.

> *"I think there comes a point when a parent's duty is as important to society as to that child, and I think ... that parents have an obligation not just to their children but to other people's children as well, ... if you don't get your child immunized, that causes other people to become ill because of it ... I believe in protecting groups over and above the individual"* (Interviewee 1).

> *"I think it's in some ways a public or community responsibility to do it"* (Interviewee 2).

Overall protection on a community or social level was important to these parents in immunizing their children. They felt obliged to immunize their children because immunizing them would not only protect their children from disease but other children as well, and hence the community, producing a type of "herd immunity". These parents felt that if you do not immunize your children, you are acting irresponsibly as a parent to your own children's and to other children's health.

All the parents interviewed believed that risk played an important role in their decision-making process. Their perception of the level of risk involved with contracting a disease and the side-effects involved with vaccination affected the decision that was made.

5.1.3 Modern Living

Modern living and its associated factors were important to the decision made by four of the eight parents interviewed. Aspects of modern living mentioned by participants included domestic conversation, time factors, and increased travel. These provided the context for their decision-making. Discussion about immunization was incorporated into domestic conversation by a number of parents.

> *"We talk about it and we continue to talk about it now as being a primary thing of importance, and ensure that both of us are aware of the dates coming up and what needs to be done, where to go, where the records are kept and everything, so that we have accuracy in that area"* (Interviewee 1).

Talking about immunization within the home displays a very open attitude towards the subject. The data also suggests an apparent cultural change towards immunization through the generations. All of the parents interviewed were asked if they could remember their parents talking about immunization when they were children. All parents replied that their parents did not talk about issues like that. For example this same parent related,

> *"I don't think we talked as a family, ..., my dad's probably like the previous generation and you do what you're told, you speak when you're spoken to, whereas I think times have changed a lot"* (Interviewee 1).

This not only shows that communication and conversation about issues in this parent's family has increased over the decades, but also that this particular parent believes in open communication. This change may be a result of our modern life-style.

Only one parent believed that a lack of time in our modern life-style contributed to the decision they made towards immunization.

> *"You just sort of go and get it done, and you just accept the facts, you don't question, you don't have time to question everything, ... if you put out a thing that said '100% of all children that vaccinate don't get sick', we'd all believe it ... you don't question"* (Interviewee 5).

This parent accepted the "facts" about immunization provided by the authorities and didn't question further but made the decision. They firmly felt that a lack of time was responsible for the decision they made towards immunization, and brought it up several times during the interview.

One parent also believed that increased travel was important to the decision they made towards immunization and that increased travel in our modern world makes immunizing children all the more important.

> *"We're living in a small world, people travel more, they're exposed to different environments, because I know every time I go overseas and come back, ... you get sick a little bit, so in that regard [it's necessary] because we travel more"* (Interviewee 3).

For this parent, increased family travel was an important influence to immunize because of increased contacts when overseas, and decreased parental health on return home. Since they did not want their children to get sick, they saw immunization as their best choice.

The category of modern living encompassed a diversity of ideas and issues, all relating to life-style. The effects and pressures of modern living and a modern life-style played an important part in these parents' decision towards immunization. At times parents felt encouraged to talk or make the decision to immunize, and at other times, parents felt obliged or pressured to make the decision to immunize such as due to a lack of time. This study allowed parents to reflect on their decision and through this aspect parents felt that they had made the right decision to immunize their children.

5.1.4 Authoritarian Influences

The role of authoritarian factors was an important influence on the decisions made by six of the eight parents interviewed. The role of authoritarian figures was discussed in terms of distrust, trust, and financial persuasion. The parents' distrust of the authorities was discussed strongly in terms of doctors and the government.

> *"I've always put it off, looked at my son, then made a decision whether he's old enough for that, which is why I've always delayed it, he's always been older when he's got it, and they always give you funny looks when you go in there ... they look at you like 'you're a bit late aren't you?'"* (Interviewee 4).

> *"I do believe it should be free choice, not compulsory ... there's too much of the government deciding what's in the public good, far too much, we should be able to decide for ourselves, we're quite capable of taking our own life into our own hands, we should be given that responsibility ... public health issues are really private health issues"* (Interviewee 3).

Both of these parents displayed distrust towards doctors and the government and believed that the decisions they made towards immunization and any public health issue should be respected by authorities. They believed that the decision a parent makes is private and should not be questioned, because as a parent you are responsible for your

own individual and your family's well-being. This belief contrasted with the obligation felt by parents to immunize their children in order to minimize disease among children in the community and to protect society.

Interviewee 6 clearly felt that the medical authorities held the answer regarding immunization. They went along with immunizing their children because the authorities said it was good, and they have scientific credibility in that area, so their authority should not be questioned.

> *"We didn't question authority did we? We more or less went along with 'This is what is done, they've done the research, they've got the doctors behind them, or them behind the doctors' ... I'm a parent who is uneducated in this area, if they say it's good, it must be good, so we're going to go along ... but it stopped there"* (Pilot 1).

> *"I just believe that as long as they've done the research and these immunizations have been out there and they keep researching and proving them, then I think we should be accessing them"* (Interviewee 6).

However, Pilot 1 viewed the situation differently. They admitted that they believed what the authorities were doing was right and that they trusted this authority, however in their own hindsight, their tone when talking about the authorities reflected distrust, and the fact that they did not question further reflects the fact that they put their trust in the doctors in the past.

Some parents felt that the government's financial incentive was the key deciding factor in immunizing their children.

> *"The biggest influence was the financial incentive, the $200"* (Interviewee 3).

> *"Money, financial, the fact that they've got you over the coals ... you get $700 once the baby is born and they keep the $250 or whatever it is until*

after 18 months, to make sure that you've immunized your child, and that's why we did it" (Interviewee 4).

These parents felt persuaded or influenced by the government's financial assistance, and that the financial incentive was the key factor that caused them to decide to immunize their children. With further discussion, Interviewee 4 revealed that they would have immunized regardless of the incentive, but that the incentive was a major factor in the decision they made. This parent displayed ambivalence towards the government.

The role of authoritarian bodies is important and varied in the decision-making process of parents towards immunization. There were those parents who displayed a distrust in the authorities, those who displayed trust and belief in the authorities, while others felt that the government was using money to get parents to immunize, and hence influenced their decision. This group of parents generally felt some level of coercion towards authoritative bodies.

5.1.5 Understanding of Disease

The parents interviewed were asked about their own model or understanding of immunity and the immune system. Two main immunity models were identified from the parents' discussions of immunity. These models stressed the importance of a good diet to boost and maintain immunity, and the importance of the immune system fighting off "invaders" on the cellular level. Four of the eight parents believed that a healthy, balanced diet played an important part in building up the immune system and that diet cannot be dissociated from better health and well-being.

> *"I think proper diet, nutrition, good care of the body is important to fight off something, but then again as we age, we deteriorate, our bodies are never quite a hundred percent, although you can help it speed up the process of getting rid of it by proper nutrition and care"* (Pilot 1).
>
> *"I believe that the immune system is quite strong but it's not something it can do on it's own, ... you need to lead a healthy, happy life to boost that immunity, eating the right foods, keeping your stress level down, not smoking, not taking drugs, that sort of thing"* (Interviewee 4).
>
> *"I think that you're got some areas in your body that can cope with fighting the disease and I think that if you eat healthy and you are healthy as a person, then you're able to fight off the disease, ... if you're run down ... then you haven't got the immunity to fight the disease as adequately as you would if you didn't have such a healthy life-style or a healthy diet"* (Interviewee 5).
>
> *"I guess the better equipped your body is and the best stage that it is, the better equipped it's going to be, like if you do eat a healthy diet and you do observe a reasonably sensible life-style then your body's better equipped, ..., I guess as long as they're getting enough fruit and vegetables and they're getting enough things ..., they can reach their potential"* (Interviewee 6).

These four parents stressed the importance of a healthy diet in fighting disease. Their model of immunity was explained in terms of a life-style model rather than a medical or mechanistic model. Their healthy diet model can be seen as a model encompassing the greater picture of health, life-style and better living.

Four of the eight parents viewed the immune system as a "fight" between the "baddies" and the "goodies". Interviewee 4 identified two different models both falling into the two categories identified here and both of their models have been described. The remaining parents viewed the immune system on a cellular level rather than a whole system.

> *"I think that the immune system is produced by our body, which produces special chemicals which can withstand and fight certain diseases in our body, ..., [it fights it off] in destruction mode, by producing certain chemicals, they possibly alienate the virus itself"* (Pilot 2).

> *"Your body has all these maybe like white blood cells go and squash it, I really don't know, ... but I would say that ... your body has all sorts of chemicals in it that are there specifically that your body creates that are there specifically to fight ... a little white cell just running off after the black gouhly monsters"* (Interviewee 1).
>
> *"The germs invade, and we have things like these trusty white cells, that try to fight it off, ..., our good 'things' attack the bad 'things'"* (Interviewee 3).
>
> *"It's the white cells that are the good ones, they're the goodies, and you have to boost your white cells up so they can go in there and fight your little baddies"* (Interviewee 4).

These four parents viewed the immune system as a "good" entity fighting off the "bad" invaders, and the whole "fight" was viewed much like a war between the good and the bad. The "good" cells were always seen as white and clean, and the "bad" disease was usually seen as black, dirty and harmful. This model of immunity was viewed on the cellular level as a "fight" within the body as opposed to the greater life-style, better health model.

Most of the parents interviewed did not actually know what the immune system was, or how it functioned, and most of them indicated their lack of knowledge in this area. At least four parents believed that they and the public in general, were not being told enough about their own health, body and their immune system.

> *"You read about it in the paper or keep hearing people say 'The immune system has to fight', but nobody actually explains how the immune system works"* (Pilot 2).
>
> *"Doctors are not informing us ... when you're desperate you always reach for medicine and doctors, prescriptions and antibiotics which, you don't know what they're doing to you, ..., we're not informed a hundred percent"* (Pilot 1).

These two comments would suggest that these two parents would welcome more information about their health and their bodies, and what treatments are being offered to

them and why. These comments are also an indication of a barrier or mistrust of doctors and/or authorities and may suggest that these parents feel as if "the wool were being pulled over their eyes". This also indicates a much needed relationship or understanding between doctor-patient communication, encompassing education as well as treatment of disease.

Three of the eight parents interviewed also believed that their knowledge of the effects of disease was an important factor in their decision towards immunization.

> *"I really believe that children should be immunized because ... I'm aware of all the consequences of disease and what happens if they're not immunized"* (Interviewee 6).
>
> *"I suppose just being aware of how disastrous whooping cough and bad that condition can be"* (Interviewee 2).

For these two parents, their knowledge of the effects of disease on the body can be seen as an extension of their models of immunity, however these parents did not identify this understanding of disease effects as part of the immune process or immunity model. The effects and consequences of disease were important in their decision to immunize their children. The consequences of disease made immunization all the more important.

The importance of issues was judged by the analysis of frequency, language, and strength at which issues were discussed. Overall, the interviews provided a rich and diverse source of data from which the key issues were identified.

Chapter 6: ANALYSIS AND DISCUSSION

The aims of this study were to identify the key influences on parents' decisions in immunizing their children against whooping cough, to determine how parents arrive at their own decisions to immunize their children against whooping cough, and to examine the roles of specific factors. These were education, Health Department information, and personal models of immunity. The study provided interesting material on all aspects of the associated research questions.

6.1 Key Influences

The two main influences identified as having an impact on parents' decisions towards immunization were family tradition and financial factors. The majority of parents identified these two influences as being important to their decision. Their importance was stressed by repeatedly bringing these topics up in their discussions. These key influences were explained by use of bold statements and strong language.

6.1.1 Family Tradition

For 63% of the parents interviewed family tradition was the most important influence on the decision to immunize. Participants acknowledged their acceptance of this tradition, and did not question their parents' behaviour towards immunization. These participants felt that immunizing their children was the best way of protecting children

from disease. They saw it as part of a "duty" that parents have towards their children and reinforced the role of their wanting to do their best for their children.

Tradition was not one of the initial factors identified as a key influence in the decision parents make towards immunization, however tradition is clearly important. Parents raised this issue and spoke strongly of their own past and of their own family tradition to immunize. Participants also spoke fondly of their parents, were very happy to talk about their traditions and experiences, and did not need much prompting to talk about their families and traditional domestic life. Some participants would have gladly talked about their family and family tradition for a long time if time allowed, which shows that tradition was important to this group of parents.

Tradition was not considered as a factor in the literature on immunization reviewed for this study although it could have been examined in the quantitative studies by asking the question "Were you immunized as a child?" However, studies conducted on smoking families show that the smoking behaviours of parents are an important influence on the smoking pattern of their children, and that children are more likely to take up smoking if their parents smoked (Noland *et al.*, 1996). Also, young smokers are more likely to give up smoking if parents, family members or close friends are suffering from smoking-related illnesses (Ho, 1998). Young smokers are also less likely to quit smoking if their parents or other family members are frequent smokers (American Psychiatric Association, 1996). Clearly, parental behaviour has a strong influence on their children's behaviour, and this influence is likely to be passed down to subsequent generations, thus influencing their behaviours and decisions towards the particular issue. Therefore in retrospect, it is not surprising that parental behaviour and hence family

tradition would be an influence on the decisions parents make towards immunizing their children.

6.1.2 Financial Assistance

The financial assistance provided by the government was another key influence on the decision to immunize for 75% of the parents interviewed. Some parents admitted that had it not been for the financial assistance provided by the government, they may not have immunized their children because they did not see the point of it. All parents for whom financial assistance was they key influencing factor in their decision to immunize felt resentment towards the government and believed they had been exploited. They believed that the government knew that new parents would need the money, and for their own financial benefit, used money as a means to get people to immunize. In talking about the government's financial influence on their decision, parents used strong language such as "biggest influence", "they've got you over the coals", and "pushed me over the line to do it". They felt that they were capable of making the decision themselves without prompting and persuasion. They also felt that immunization is really only part of the government's political agenda. This is true of the Federal government's immunization scheme which incorporated immunization as part of the 1995-96 Budget (Commonwealth Department of Human Services and Health, 1995).

All parents interviewed explained that they did not know about the financial assistance until after the birth of their child, when they received a letter explaining the incentive along with other relevant information in a hospital "bounty bag". It is unclear as to why

the government does not make this information available sooner, but the parents interviewed clearly felt that the financial assistance was an influencing factor in their decision and felt resentful. In this sense, the government's financial incentive can be seen as a "two-edged sword". Parents take the incentive, but are less respectful of the government afterwards because they felt the government showed no respect towards their feelings involved with making their decision. This shows that parents display compliance without conviction or respect towards the government.

6.2 Decision-Making Processes

In general, parents made a tentative decision on the basis of one over-riding influence. They then sought confirmation for the decision from other sources. For example, the group whose decision was dominated by family tradition also checked with their own doctors or health centre practitioners. They didn't collect all possible evidence and make a decision on this basis.

It is important to note however that as a group, parents displayed resentment towards government authorities because of the level of control that their financial scheme imposed. However they displayed acceptance of advice given by doctors in person because of their scientific credibility, but displayed ambivalence towards bureaucratic bodies such as the Health Department. The way in which parents arrived at their decision to immunize could be seen in their discussion of the importance of family tradition to their decision, and the way in which they discussed the risks involved with the decision that was made. Parents tended to discuss the decision-making process as if

they were re-living it in order to re-assure themselves of the decision they made, and their discussion tended to take on a more self-reflective nature.

6.2.1 Acceptance of Family Tradition

The group of parents for whom tradition was an important influencing factor in their decision to immunize, accepted tradition from their parents and used their parents as role models and teachers. This learnt behaviour can manifest itself in a person's beliefs. An example of this occurred with one parent who had three children and one child had had a side-effect to a particular vaccine. When explaining this situation, the parent stated that none of their children had experienced side-effects except one, and one child experiencing side-effects suggests that one-third of her children did, which is a fairly large ratio. This parent had a positive attitude towards immunization stemming from a deep seated belief in immunization. This suggests that when parents believe in immunization, they take the side-effects in their stride. For this parent, their traditional beliefs in immunization functioned as a "lens" through which they observed the situation. One child experiencing side-effects was then believed to be minimal.

Studies of parent and offspring smoking behaviours highlight the increased influence of parental smoking behaviours on their children's eventual smoking behaviours (Noland *et al.*, 1996; Ho, 1998; American Psychiatric Association, 1996), however, these studies did not discuss the psychological acceptance of parental behaviour and hence family tradition on offspring behaviour. This may suggest that the acceptance process is complex and involves many processes. The acceptance of family tradition and parental

behaviour in the immunization issue was an important decision-making process. Participants felt strongly about their parents' beliefs about immunization and talked about it many times. Parental decisions and behaviour therefore affect the behaviour and decisions made by their offspring when they are faced with the same situations.

6.2.2 Trust

Although all the parents interviewed believed immunization was good, they also realized that immunization involves risks. However, parents believed that the risks involved with contracting a disease far outweighed the risks involved with vaccination. This again is connected with parental beliefs in immunization obtained through learnt experience and acceptance of family tradition. Parents used words such as "disastrous", "suffer", and "bad" to describe the consequences and risks involved with disease contraction, and words such as "important", "obligation", and "better" to express the importance of immunizing children. This suggests that their belief in immunization "coloured" the evidence they had about immunization. Again, this belief acts as a "lens" through which the experience is interpreted.

If the acceptance of authoritative opinion in their decision-making process played an important role, then this reflects their trust in authoritative bodies, and authoritative opinion. Irwin and Wynne (1996) point out that it is common for society to put their trust in expert bodies, but expert bodies often betray this trust by not fulfilling their expected role (as in the case of the nuclear accident in Tokaimura, Japan) (Irwin and Wynne, 1996; Hadfield *et al.*, 1999; Reuters, 1999a; Reuters, 1999b). If expert bodies

continue to betray this trust, it can lead to a total loss of trust of authorities by the public (Wynne, 1996). Seventy five percent of parents felt that there was a lack of respect for the individual in the "mass system" of public health. Parents felt that the government or public health system is set up for the "average" non-problematic situation, and that hospital and medical information denies, obscures and does not deal with difficulties or rare cases.

This "mass" system can be linked to the effects of modernity and living within a modern, technological society. Risk as defined by Beck (1992) explains that modernization introduces hazards and insecurities (Beck, 1992). Modernity has brought with it technologies with costs and benefits, which when not explained to the public correctly, generate unrealistic expectations. If unfulfilled, unrealistic expectations can arouse insecurity and doubt. This can not only cause the public to lose trust in the technology, but also in the authority that promotes it. This may not necessarily lead to a total collapse of trust in the authorities and the technology, but to certain aspects of both, which is what parents interviewed were expressing in their discussions relating to the government and doctors.

The issue of trust was a complex area of decision-making for the parents interviewed. Parents generally felt that they did not trust the government, but felt that they did trust the medical authorities, however at other times, it was difficult to determine who they did and didn't trust. Trust clearly played a role in the decision-making process for this group of parents, whether trust in tradition or trust in authoritative opinion.

6.3 The Roles of External Factors to the Decisions Made by Parents

At the beginning of this study, it was thought that education, health department information, and personal models of immunity would play a part in the decisions made by parents towards immunization. These concepts were incorporated into the interview questions in order to explore whether these factors had an effect on the decisions parents made. The extent to which these factors had an influence on their decisions could be seen through the amount of time parents spent talking about each factor, the depth of discussion, and their believed importance of each factor.

6.3.1 The Role of Education

Education played an important role for 12% of the parents interviewed. The remaining 88% believed that education about immunization was not important in the decision they made, and recalled that they had been taught nothing about immunization at school. When parents were asked about how they felt their basic education had affected their decision to immunize, 100% said they didn't feel it had an effect and were very brief in their answer. Parents didn't spend long talking about education and only answered the questions they were asked. When prompted with further questions to encourage discussion, parents answered the prompts and did not discuss the issue further. Education was never raised in free response by the participants.

Given this response, education regarding immunization was clearly not important to the parents in the sample, and did not influence their decision. This may be due to the fact

that they did not receive any education about immunization at school. Since it is not compulsory to teach immunization as part of the curriculum (Education Department of Western Australia, n.d.), this may explain why parents felt they had been taught nothing about immunization at school. This raises the question, Had parents been taught more about immunization at school, would education have had an influence on the decision they made?

The level to which people are educated might be expected to affect the way in which they access and evaluate information. In addition, information about immunization that parents learned in school, will alter how they interpret and understand information. Different levels of education and knowledge exist within the public and therefore the same information will be understood differently by different people. This can also be said of the effect that education level has on immunization up-take rates. The fact that education had no influence on the decisions parents made towards immunization in this study, throws light on the somewhat contradictory findings of Bazeley and Kemp (1995) and the Wallis Consulting Group (1995). Both studies identified education as a key factor affecting up-take rates but did not discuss the relationship between education and up-take rates (Bazeley and Kemp, 1995; Wallis Consulting Group, 1995).

6.3.2 The Role of Health Department Information

The information supplied by the Health Department concerning immunization did not play a role in the decisions parents made to immunize. Parents were ambivalent in their reactions towards public health department information. On one-hand, parents felt that

they were not receiving enough information about immunization form the Health Department and would have welcomed more, while on the other-hand, parents felt that the information available from the Health Department was not useful or informative and did not affect their decision. One hundred percent of the parents interviewed felt that health department information (in the form of pamphlets, posters and brochures) had no effect on the decision they made. Parents actively acknowledged this by stating so directly once asked, and did not discuss the issue further. However, further along in their discussion, 75% of parents explained that they wanted more information about immunization to be given to them or made more accessible, and that they were actively seeking information and would not lose the opportunity to gain more, and believed that the health department pamphlets explained little and did not contain enough information.

These parents not only wanted more written or published information, but also more information from doctors, the government, and scientists, primarily in the form of reliable statistics. However, 75% of parents believed there was a communication barrier between themselves and doctors. This raises a question about the possible influences of medical advertising and media portrayal of the doctor-patient relationship, on everyday doctor-patient communication. Lupton (1993) and Neill (1989) found that a greater distance between doctor and patient has emerged since the 1950's in medical advertising. This can also be said for average doctor-patient relationships. However this is contrary to the NHMRC's policy for increased patient involvement with the public health system (National Health and Medical Research Council, 1993). Although 75% of parents wanted more information about immunization, 100% of parents believed that

the media (television, magazines, brochures) did not play a part in the decision they made.

6.3.3 The Role of Personal Models of Immunity

It was uncertain as to how many of the parents interviewed believed that their understanding or model of immunity played an important role in the decision they made. Parents were asked how they believe the body fights off disease, and they simply described their model of how the body fights or avoids sickness when asked and did not talk about the issue further. They also answered prompt questions accordingly and did not spend much time talking about the issue. If parents were not asked about their models of immunity, they would not have brought the subject up. This suggests that like education and Health Department information, models of disease were not important to parents' decision to immunize.

Overall, parents' decision were influenced by one of two factors, tradition or financial assistance. Medical opinion paralleled the influence from the key factor and provided a basis for parents to confirm their decision, but did not influence their decision. Education, Health Department information, and models of disease did not play a role in parents' decisions.

Chapter 7: CONCLUSIONS AND FUTURE DIRECTONS

In making a decision as to whether to immunize their children against whooping cough, family tradition and the government's financial incentive were found to be the most important influences. Parents repeatedly brought these two issues up and acknowledged their importance.

Parents' decision-making involved two main processes. Firstly, parents were strongly influenced towards immunization by their family tradition or by their wish to receive the Federal government's financial incentive. Secondly, they actively sought medical opinion from their own doctor or local health centre. The advice they received confirmed their original decision. Medical opinion was not the major influence on their final decision. It acted as an "enhancement" to the decision that was to be made. Parents generally displayed different attitudes towards doctors as people, and public health pamphlets as bureaucratic material.

Education, Health Department information, and personal models of immunity did not have any noticeable influence on parents' decisions to immunize. Parents needed to be asked about these factors and did not bring them up. They answered very briefly when asked. It was initially expected that these factors would play an important role in the decisions that parents made, but after the interviews it was clear that they had little effect on the decision parents made to immunize.

This study initially set out to explore why some parents chose to immunize and others chose not to immunize their children, but due to a lack of respondents who had not

immunized their children, and a lack of time to recruit participants a second time, this could not be achieved. A parallel study needs to be carried out on a group of parents who chose not to immunize. It would be interesting to uncover their underlying beliefs about immunization and the impact of family tradition. This area of research has implications for the Health Department, and may be useful in promoting public health policies.

The fact that family tradition played a much greater role than formal education in the decisions made by parents raises possible questions about the effects or influences of education on public health. These questions have implications for schools and the curriculum council when developing effective future learning programs. Research needs to be carried out on how education experience might influence the decision-making process of parents who decide to immunize, and parents who don't.

Most parents believed they had a good relationship with their family doctor and local Health Clinic and therefore accepted public health advice from them, but they were suspicious of advice or "advertising" from bureaucratic bodies such as the Health Department. With the increasing trend towards moving public health services, such as immunization, to large public health centres, it is possible that trust based on human interaction will be lost. Research needs to be carried out on how parents will view these changes and whether this move will lead to a loss of trust in health authorities and services. The challenge for doctors, hospital officials, and the Health Department is to develop better communication and an interactive relationship with parents. Future research needs to be carried out on the effect of medical advertising on doctor-patient communication.

This study produced rich data with interesting findings which have implications for public health, medical, and government authorities. This study also raised many questions for further research, and uncovered many complex areas concerned with decision-making.

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APPENDICES

Appendix 1.0: Poster format for recruiting subjects, placed around Edith Cowan University, Mount Lawley Campus.

RESEARCH ON WHOOPING COUGH IMMUNIZATION

As a Biological Science student, I am currently doing an Honours research project on whooping cough immunization.

The research is concerned with the reasons behind a parents' decisions in immunizing their children - against whooping cough.

For this research, a sample of approximately 12 university students who are parents (male/female) with children between the ages of 2 months and 6 years is needed. A private interview will be conducted (approx. 1 hour) and morning tea will be provided.

If you are a parent with children within this age group and have previously or recently immunized or chosen not to immunize your child/ren against whooping cough, please contact me if you are willing to participate, or for more details.

All information obtained will be strictly confidential. Your anonymity is respected, and no names, numbers or identifying marks will be used in the study or any reports written.

The ECU Ethics Committee has approved this research.

Thank-You for your consideration.

Ellie Kirov

Ph: [redacted]
E-Mail: [redacted]

Appendix 2.0: Consent letter given to subjects willing to participate to acknowledge participation.

You are invited to participate in a project that is looking at parents' opinions on whooping cough immunization. If you are willing to participate in the project, then I will need you to attend a private interview. During the interview, I will ask you a series of questions regarding whooping cough immunization and ask you to talk to me about the decisions you have made as a parent about immunizing your child/ren.

What Do You Gain From Participating?

- You will have the opportunity to clarify your own thinking about immunization
- You will have the chance to reflect on your own decision/s about immunization

What Do I Gain As A Researcher?

- I have access to your experiences and opinions on immunization, and how this relates to your child.
- I gain a better understanding of how the public feels towards child immunization.

What Does Society Gain?

- While many parents immunize their children against whooping cough, there are still many who don't. This project is not ant-immunization, nor pro-immunization, but is concerned with exploring the decision-making processes parents use in order to decide whether to immunize their children. Government Health Departments need to know what people think about this issue.

How Much Time Will It Take?

- An interview lasting approximately 1 hour
- Morning tea will also be provided

How Will the Information Be Used?

- The material will be used for research purposes, and possible subsequent publication of the findings
- All tapes used in the interview will be wiped and any notes taken will be shredded after completion of the project
- All final analyzed information will become part of a final Honours thesis
- No information will be included by which you may be identified as an individual

Queries?
If you have any questions concerning this project, please contact me so that I can discuss them with you.
Ellie Kirov (Researcher)

Contact Details:

Ellie Kirov
School of Natural Sciences
Edith Cowan University (Mount Lawley Campus)
2 Bradford Street
Mount Lawley 6050

Phone: 9370 6133 (W)
[redacted]

Email: [redacted]

Would You Like To Participate?
If you agree to take place could you please sign below.

I have read the information above and any questions that I have asked have been answered to my satisfaction. I agree to participate in this activity, realizing that I may withdraw at any time.

Name.....

Signature.....

Date.....

Appendix 3.0: Release form given to subjects willing to participate to allow information to be documented.

RELEASE FORM

I .....
(interviewee's name)

give permission for Ellie Kirov (Edith Cowan University) as researcher on the project "Parents' Opinions on Whooping Cough Immunization" to use the interview, or part of the interview, conducted with me on

.....
(details of interview or group session - date, time, place)

for research, publication (both in print and electronic form), and/or broadcasting. I understand that I will not be identified by name in such publications.

Signed .....

Date .....

Interviewer's Signature .....

Appendix 4.0: Interview questions used in discussions with participants.

INTERVIEW QUESTIONS
(N.B: Dot points represent follow-up questions or prompts)

1. DEMOGRAPHIC DATA

a) How old are you?

b) How many children do you have?

c) How old are they?

d) Have you immunized any of your children?
- Against whooping cough?
- When?
- Where?

2. CENTRAL QUESTION

a) How did you come to this decision?

3. PAST EXPERIENCE - PERSONAL

a) Were you immunized against whooping cough as a child? Tell me about it.
- How old were you?
- What was the family conversation about it?
- Were you told anything about it?
- Is there anything else you remember?

4. PAST EXPERIENCE - EDUCATION

a) At the time of becoming a parent for the first time, what was your education level?

b) Did that education include material on immunization?
- In which year did it occur?
- What do you remember about it?
- Did it make sense?
- Have you learned anything about immunization since your formal education?

5. PUBLIC HEALTH DEPARTMENT INFORMATION

a) Did anyone (medical/health authorities) explain to you what would be involved in vaccinating your child against whooping cough?
   - What did they tell you?
   - Who told you?
   - Were side-effects mentioned?
   - Did they answer all your questions?
   - How good was the communication between you and the authorities?

b) How did you feel when your child received their vaccination?
   - Were they helpful at the clinic?

6. INTERPRETATION OF SCIENTIFIC/MEDICAL INFORMATION

a) Have/Did you receive any pamphlets regarding immunization? (Refer to the copied pamphlets enclosed)
   - At what stage?
   - Do they look familiar?
   - How do you feel about them?
   - What do they mean to you?
   - In what ways did they influence your decision?

7. MODELS OF IMMUNITY AND IMMUNIZATION

a) What is your understanding about the nature of whooping cough?
   - Impact on child?
   - Impact on parent?

b) What is your understanding of how immunization works?
   - Do you believe that it works?
   - Do you believe it is necessary?
   - Do you believe it is important?

c) What do these pictures tell you about immunization and immunity? (See pictures enclosed)
   - How do they make you feel?
   - Tell me about what they "say" to you
   - Is there any image missing here that you would have liked to have seen?
   - How do you believe immunity works?

8. EXTRA QUESTIONS

a) Do you have any other beliefs that affected the decisions you made towards immunization? Do you mind telling me about it?

b) Is there anything else you would like to tell me?
   - Comment on?

Appendix 4.1: Images used in conjunction with the interview questions.

Images Taken From:

(A) Beardsley, 1995, p 88.

(B) Beardsley, 1995, p 92.

(C) Be safe, not sorry, 1999, p 13.

(D) Butel, 1985, p 66.

(E) Chalk and Baster, 1976, p 102.

(F) Hamilton, 1998, p 28.

(G) Immunization rate too low, 1999, p 8.

(H) Mader, 1993, p 97.

(I) Nossal, 1993, p 20.

(J) Raven *et al.*, 1992, p 179.

(K) Raven *et al.*, 1992, p 179.

(L) Raven *et al.*, 1992, p 179.

(M) Raven *et al.*, 1992, p 189.

(N) Raven *et al.*, 1992, p 520.

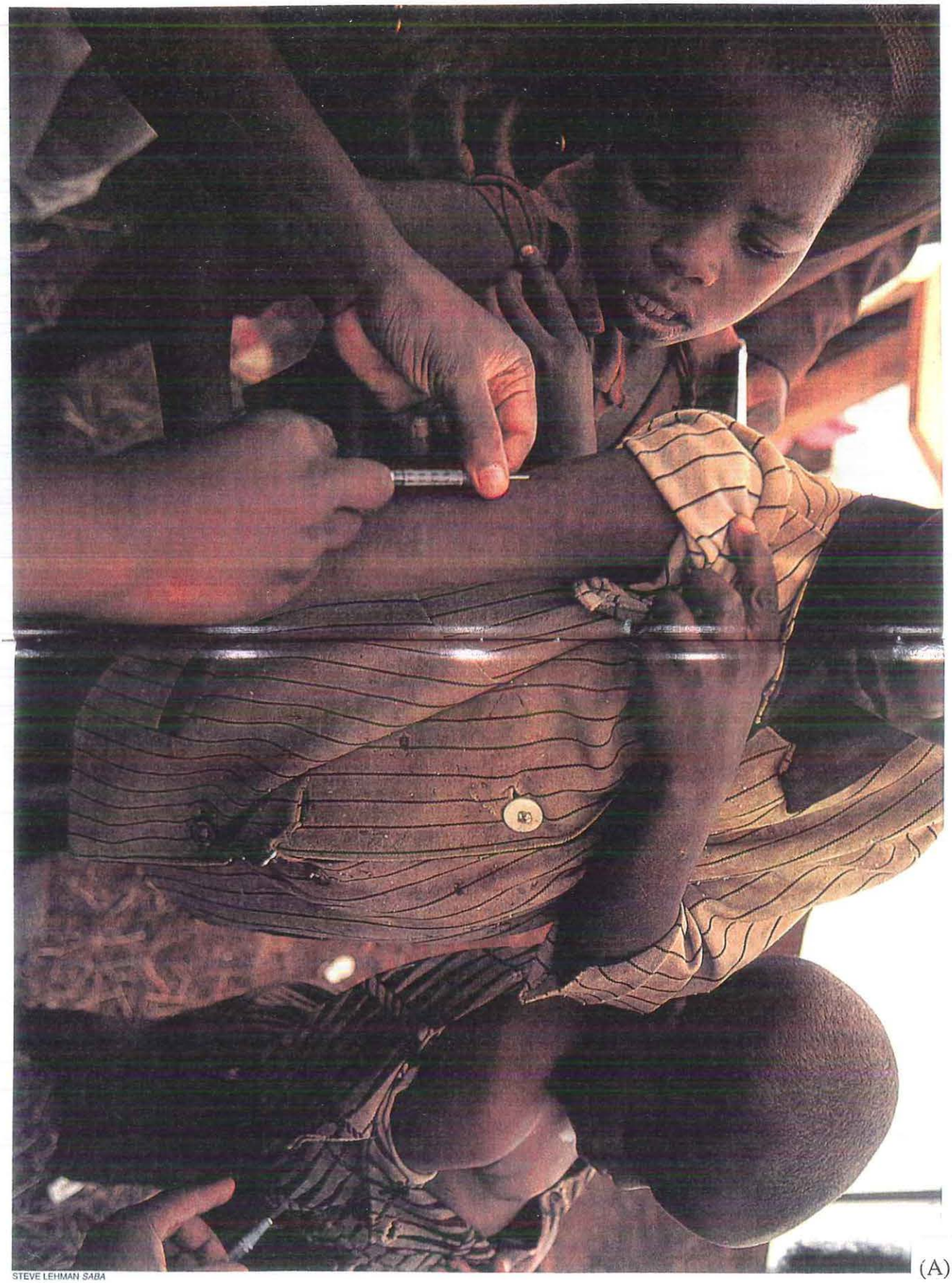
(O) Sale, 1989, p 56.

(P) Sanders, 1997, p 22.

(Q) Tamarin, 1996, p 142.

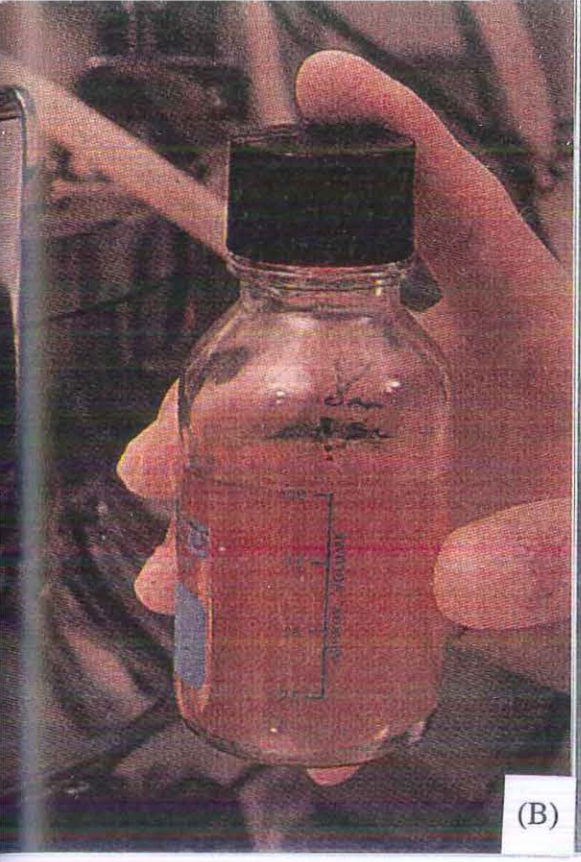
(R) Tamarin, 1996, p 143.

(S) Watchtower and Bible Tract Society, 1988, p 231.



STEVE LEHMAN *SABA*

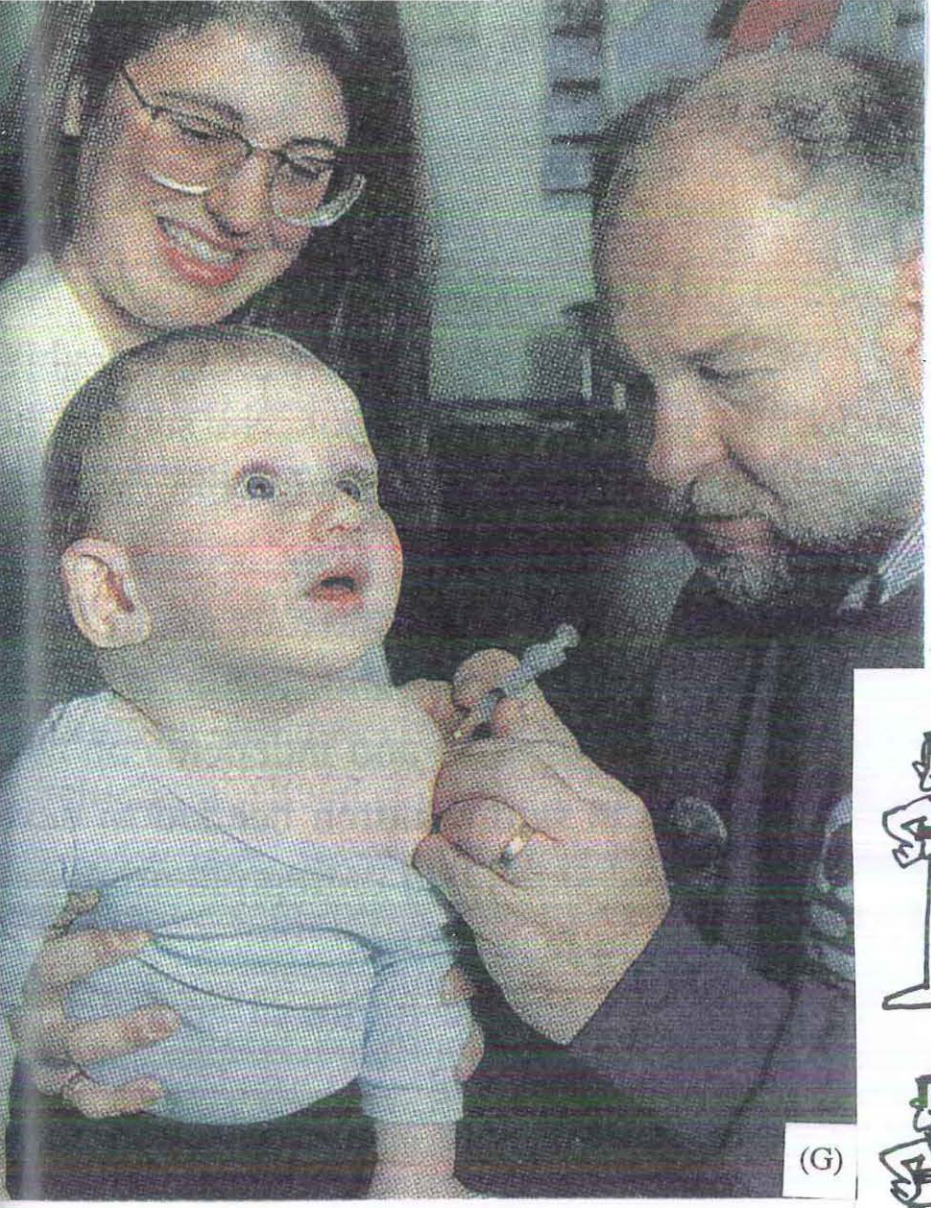
(A)



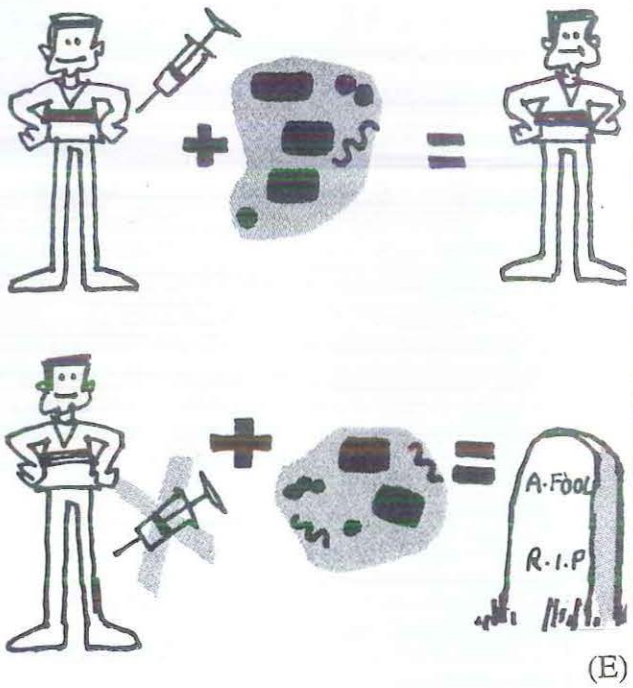
(B)

(C)

(D)

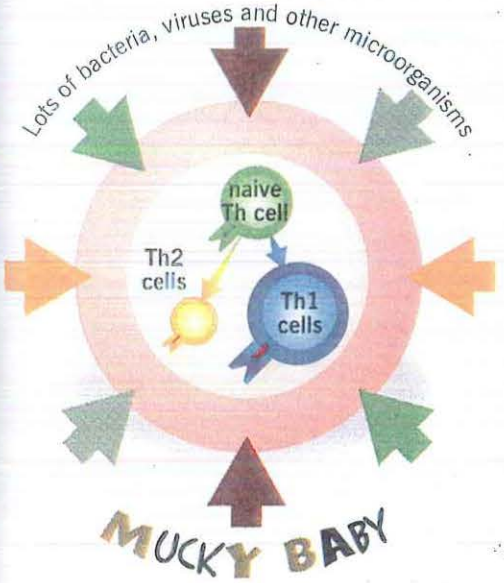


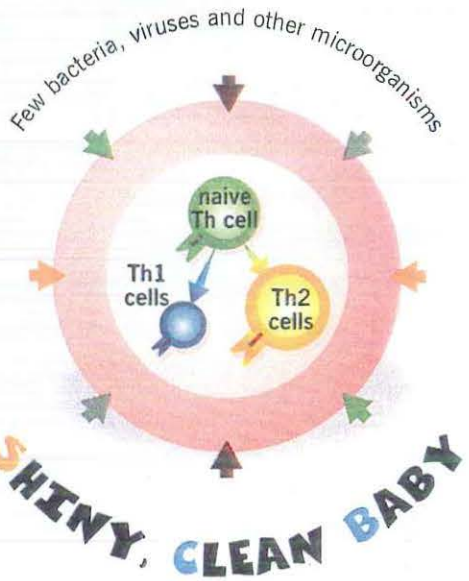
(G)



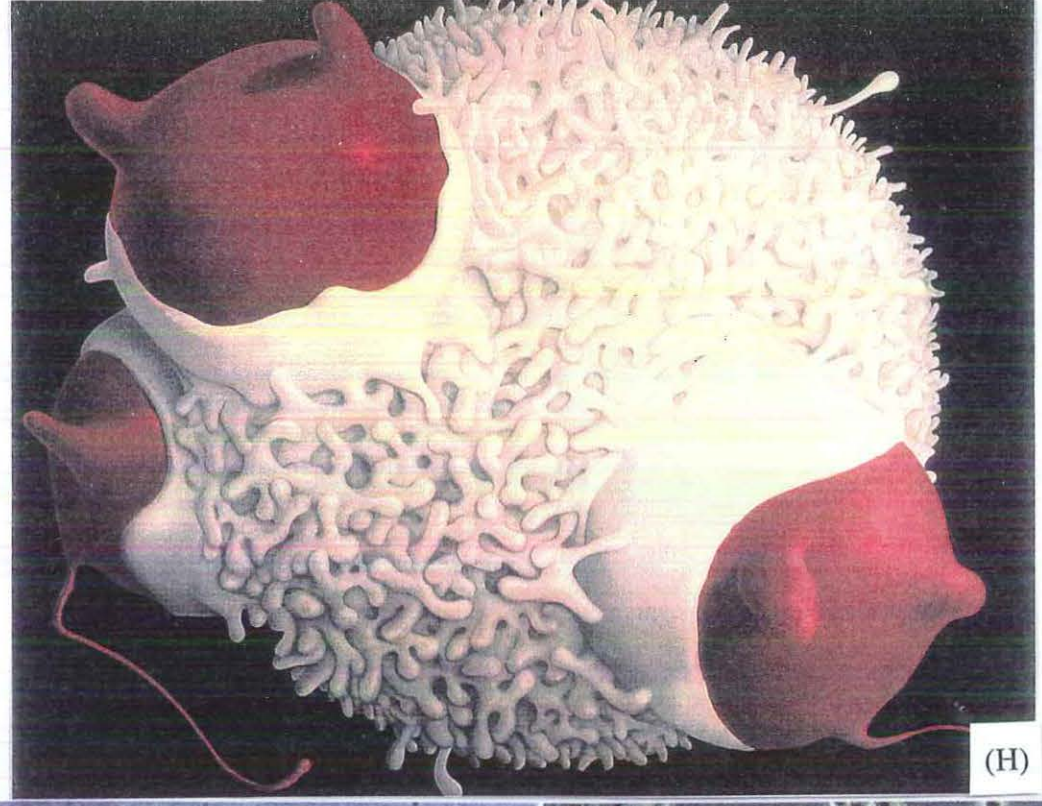
(E)

SETTING THE SCENE





(F)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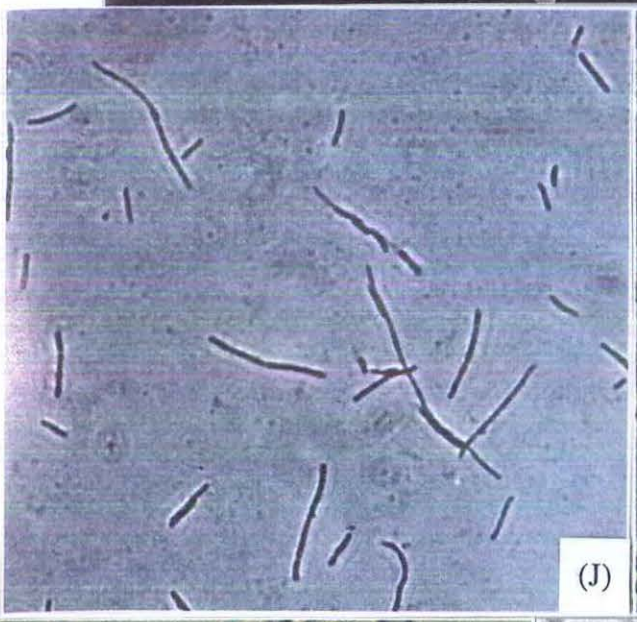
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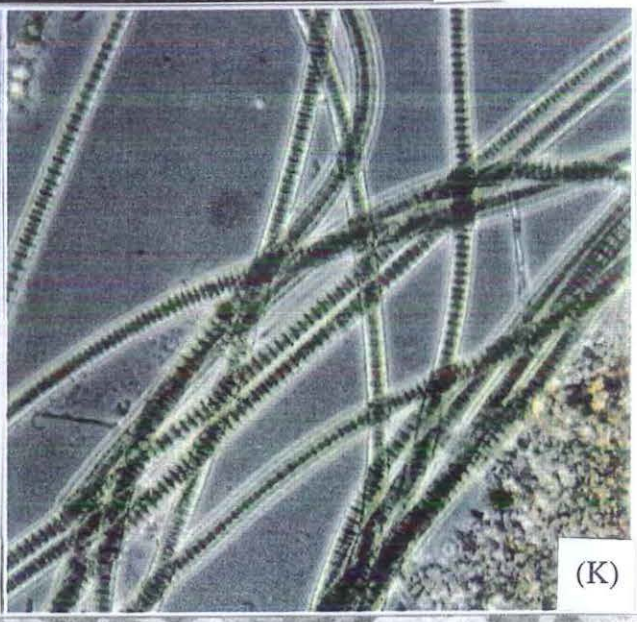
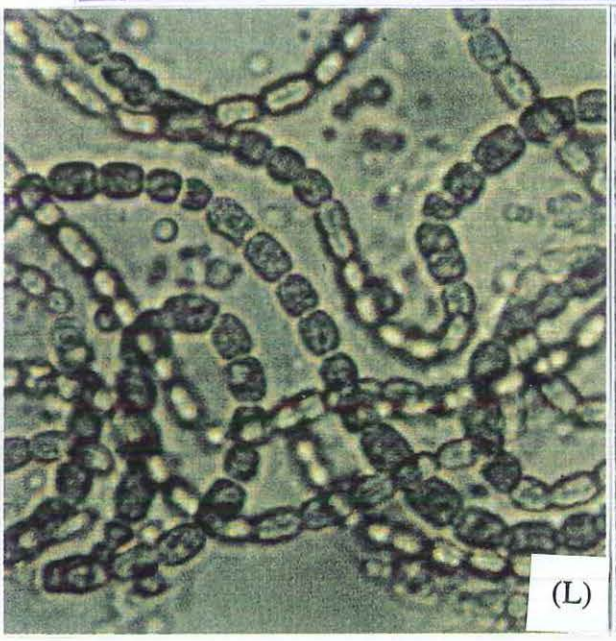

(K)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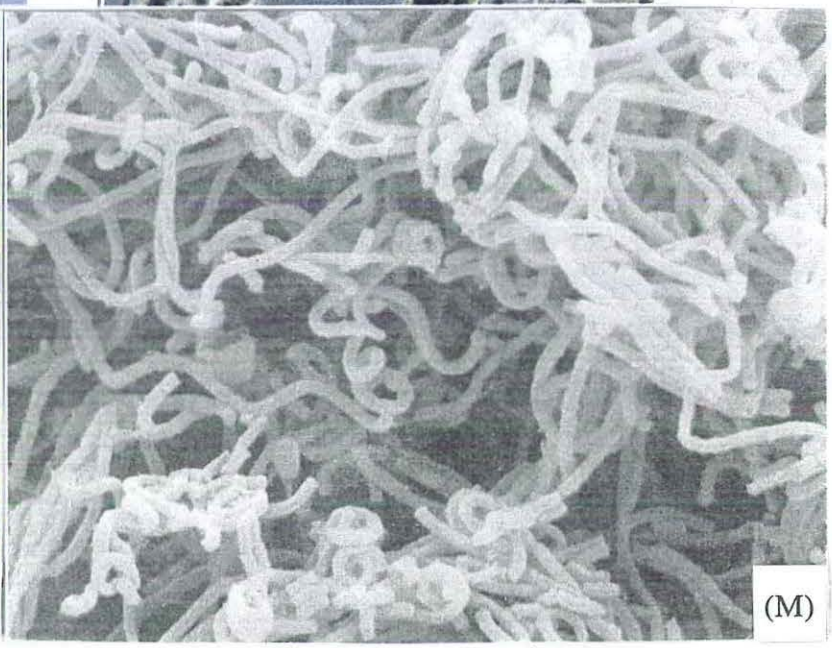
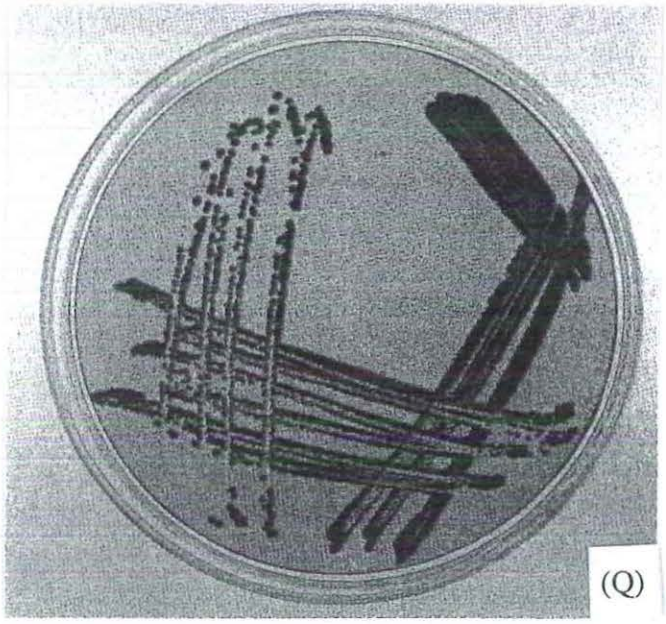

(M)

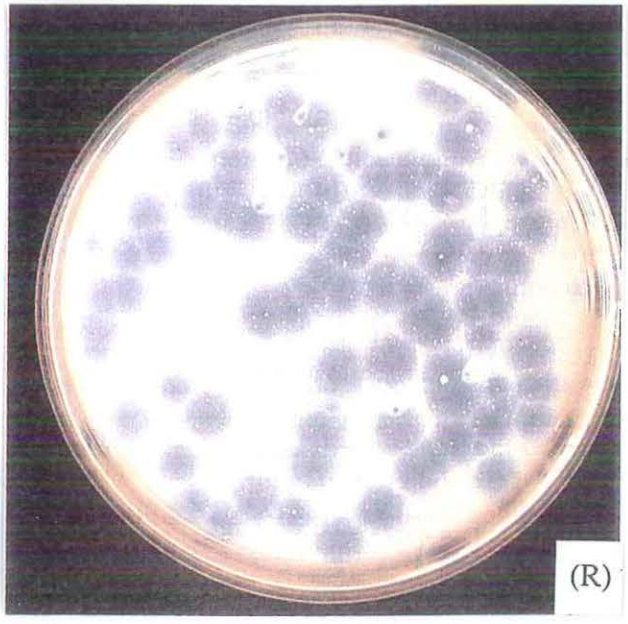
(N)

(O)

(P)



(Q)

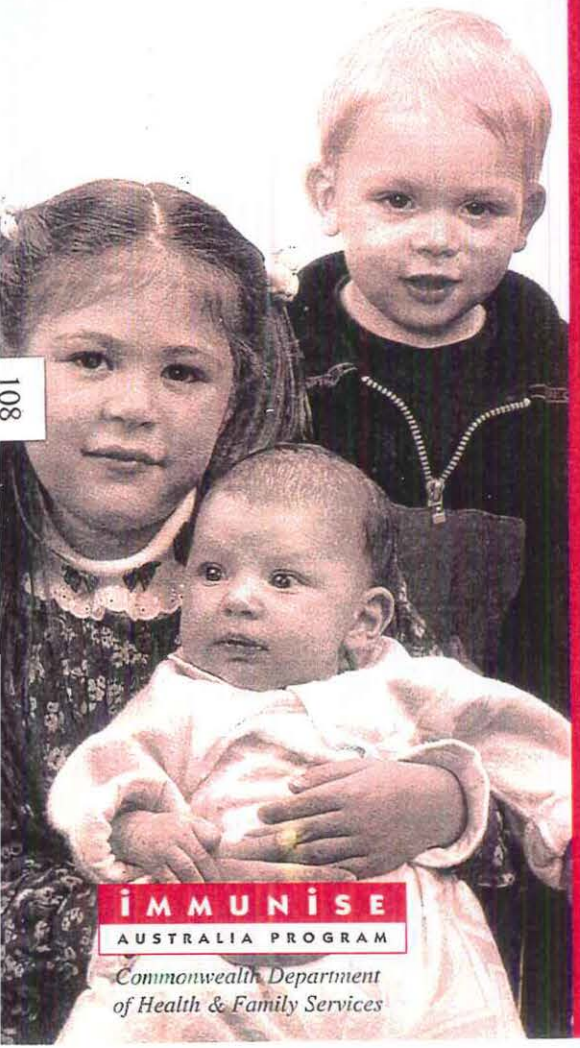


(R)

(S)

Understanding childhood

IMMUNISATION



IMMUNISE AUSTRALIA PROGRAM

Commonwealth Department of Health & Family Services

IMMUNISATION

Immunisation and child care payments - What it means to you!

COMMONWEALTH CHILD CARE PROGRAM

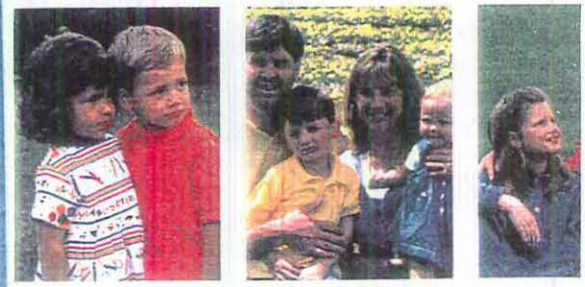
IMMUNISE AUSTRALIA PROGRAM

A joint Commonwealth and State/Territory initiative

Commonwealth Department of Health and Family Services

Has Your Family Been

Immunised



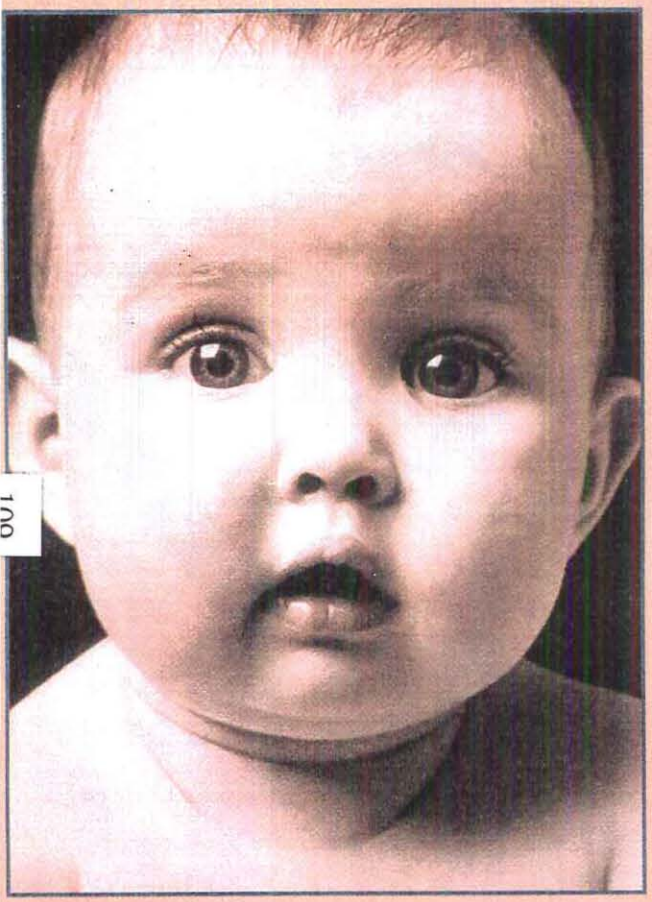
A guide to your family's immunisation needs

IMMUNISE AUSTRALIA PROGRAM

A joint Commonwealth and State/Territory initiative

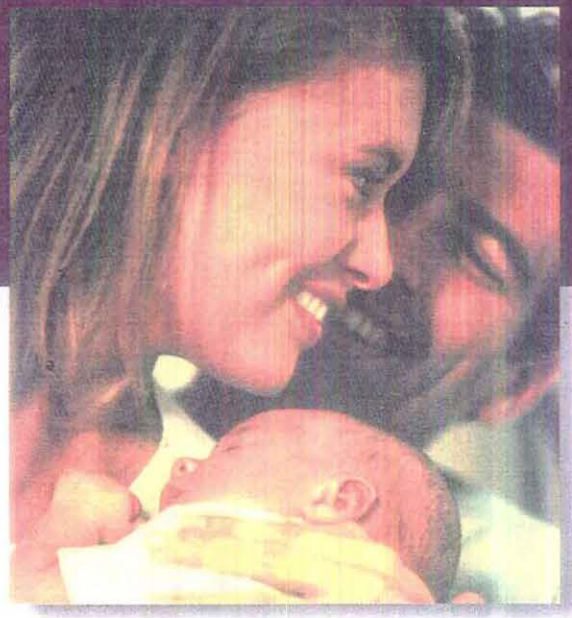
Appendix 4.2: Government Health Department pamphlets used in conjunction with interview questions.

DON'T LET YOUR CHILDREN FACE UNNECESSARY RISKS.



PROTECT THEM AGAINST DIPHTHERIA, TETANUS AND PERTUSSIS.

'Is your child due for an immunisation?'



Australian Childhood immunisation register

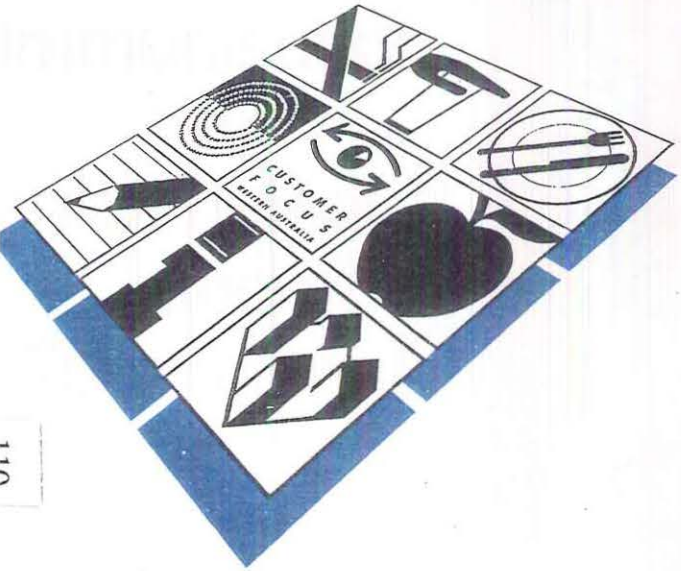
The Australian Childhood Immunisation Register records details of your child's immunisation. This information will be used to improve Australia's childhood immunisation levels.

HEALTH INSURANCE COMMISSION
administers the Australian Childhood Immunisation Register

IMMUNISATION

THE REASONS FOR IT ARE HERE IN BLACK & WHITE

Health Promotion Services



PROMOTING HEALTH THROUGH PREVENTION

Health Promotion Services' commitment is to provide accurate and helpful health information and advice on request to all West Australians. Our major objective is to ensure optimum public health standards throughout the community by assisting in the prevention of avoidable illness, injury and death.

"Let's look at..

Medicines For Your Child

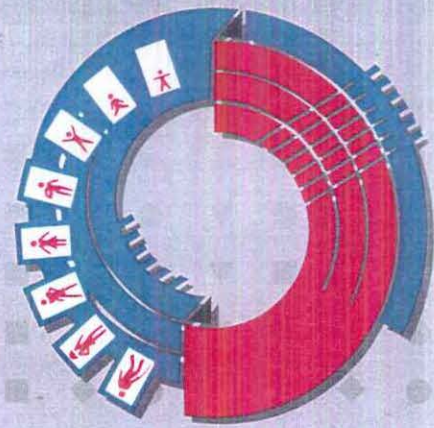
Australian Childhood Immunisation Register

From 1 January 1996 the Australian Childhood Immunisation Register started to record the details of you child's immunisations. This information will be used to remind you when an immunisation is due or overdue.

Australian childhood immunisation register

Hib Immunisation for Aboriginal and Torres Strait Islander People

Immunisation –*The Facts*



IMMUNISATION

THE FACTS